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ABSTRACT

After extensive planning, the American Indian Higher Education Consortium (AIHEC) concluded that a satellite telecommunications network linking AIHEC institutions to each other and to other institutions of higher education would greatly enhance their ability to provide quality education to their students and communities. This is the first step in providing a technical and programmatic foundation for future local networks serving branch campuses and off-campus sites, as well as connections to statewide networks. This report documents the year-long planning effort that involved representatives from each of the 27 AIHEC institutions (tribally controlled and Bureau of Indian Affairs colleges) plus outside consultants. Sections cover: (1) project background and mission statement; (2) project design and procedures; (3) planning assumptions related to tribal differences and autonomy, funding sources, new technology, regional clustering, staffing, and training; (4) program and services needs assessment; (5) technical considerations in networking; (6) operational and administrative considerations related to staffing, enrollment, course procedures, and staff training; (7) governance and organizational issues; (8) operational costs and funding; (9) second year planning and objectives; (10) potential funding sources; and (11) future network developments. Recommendations in each area are summarized. Appendices include lists of AIHEC representatives and project personnel, a project timeline, sample budgets, profiles of telecommunications facilities at AIHEC institutions, and descriptions of six national distance-learning networks and three approaches to video production. (SV)

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AMERICAN INDIAN HIGHER EDUCATION CONSORTIUM

(AIHEC)

TELECOMMUNICATIONS PLANNING PROJECT

YEAR ONE

FINAL REPORT

and

RECOMMENDATIONS

THE

AIHEC

DISTANCE LEARNING NETWORK

RC019253

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
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April 14, 1993

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AIHEC

YEAR ONE FINAL REPORT & RECOMMENDATIONS

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EXECUTIVE SUMMARY

Introduction

In 1991 Congress provided funding for the American Indian Higher Education Consortium (AIHEC) "to develop a plan that would identify how the 26 tribally-controlled and Bureau of Indian Affairs colleges can more effectively achieve their mission through the utilization of telecommunications technologies." The $250,000 appropriation was administered by the U.S. Department of Commerce's Public Telecommunications Facilities Program (PTFP).

There are now twenty-seven tribally-controlled and BIA-operated colleges, located in 12 states, that comprise the non-profit AIHEC corporation. Two of the AIHEC colleges offer 4-year degrees; 25 have enrollments of less than 1,000 students; and all but three are located on reservations in rural areas. Each AIHEC member is autonomous, accountable either to its local tribe or to the Bureau of Indian Affairs. By design, no centralized AIHEC policy directives or AIHEC-mandated programs are prescribed to the member colleges.

A Telecommunications Executive Committee appointed by the AIHEC Board of Directors provided oversight throughout the project. The college presidents actively participated, as did the academic deans, project representatives designated by each college, technical staff from several of the colleges, and consultants in distance education. During the year, the college representatives held two plenary sessions; the academic deans met for the first time ever for a two-day conference; the Telecommunications Executive Committee met seven times face-to-face or by conference call; and the project director visited 22 of the college campuses but was in constant contact with all 27. Seven interim reports were issued during the year, including a technical profile of each of the colleges and results from a needs assessment study of each college. Staff from the PTFP and the Public Broadcasting Service (PBS) provided valuable assistance to the project.

A Telecommunications Network Can Significantly Enhance Educational Programs in Indian Communities

The American Indian Higher Education Consortium (AIHEC) has concluded, on the basis of its year-long telecommunications planning, that the development of a satellite educational telecommunications network linking AIHEC colleges to one another and to other institutions of higher education would contribute significantly to improving the education, training and quality of life for Native Americans.

An AIHEC distance learning Network will empower the tribally-controlled and BIA-operated colleges to:

- Share AIHEC-originated collegiate instruction between institutions;
- Share other distance learning programs via satellite or other telecommunications means;

- Share tribal information from college to college;
- Provide in-service professional development training for TCC faculty and staff, tribal employees, and educational telecommunications personnel responsible for such inter-institutional and inter-tribal sharing; and
- Provide administrative communication and in-service faculty training.

Our Assessment Has Defined the Specific Educational Needs that a Telecommunications Network Can Meet

As determined from the needs assessment and the academic deans' meeting, an AIHEC distance learning network has defined a number of educational and informational needs of AIHEC colleges and their tribal communities. The most commonly identified needs include:

- Undergraduate credit courses in:
  - advanced math and science including natural resources and environmental studies;
  - business and business administration;
  - nursing and other health-related subjects--specifically third and fourth year courses not available at the two-year AIHEC colleges;
  - tribal languages;
  - alcohol and drug abuse; and
  - elementary and secondary education--specifically third and fourth year courses not available at the two-year AIHEC colleges
- Graduate degree programs in:
  - education;
  - business administration; and
  - health-related areas
- Non-credit programs for:
  - fundraising;
  - writing skills;
  - self-improvement skills;
  - alcohol and drug prevention;
  - training in the use of telecommunications and computers; and
  - in-service training for staff and faculty
- Administrative communications between and among:
  - AIHEC presidents, deans and other key colleges administrators;
  - Tribal leaders; and
  - Other Indian-related agencies and programs.

Based on the facilities profiles and the deans meeting, several AIHEC colleges have experience and are interested in producing various types of video-based courses and programs. The deans will work together to identify specific courses that are needed, and also select those best able and qualified to produce them. The deans will also continue to develop policies and procedures governing registration, accreditation, training and operation of the network.

Laying the Foundation for the Telecommunications Network Will Require an Expenditure of $2.1 Million

As initial implementation phase is recommended as the first step toward building a comprehensive telecommunications network that will eventually serve multiple sites on AIHEC college campuses, as well as other receive sites to reach all of Indian Country. The specific equipment and operational support services recommended for the first implementation phase are as follows:

- A special satellite receive dish for the main campus of each AIHEC college, plus the Washington, D.C. AIHEC office; cost: ..... $336,000.
- A Basic TV Reception Classroom equipment package at each college, to include TV monitors, VCR, computer, printer, modem, FAX, telephone equipment, CD ROM and computer software; cost: ..... $405,000.
- First year funding for a Campus Network Coordinator for each campus to oversee installation of equipment and effective use of the network in its critical start-up year; cost: ..... $996,300.
- Special training for the Campus Network Coordinators and first year support for network operations, three network staff and initial program services; cost: ..... $360,600.

The total cost for the first implementation phase is $2.1 million.

Our conclusion is that the AIHEC network use existing uplinking services on a contract basis, as needed, during this initial phase, rather than purchase and support its own uplink facilities. This arrangement will make it possible for programs and courses to originate from several AIHEC colleges rather than a single uplinking facility.

Federal Funding Will Be Required to Lay the Foundation of the Network

New funding will be required to purchase and install the technology required, to establish the basic network to interconnect the 27 colleges, and to support initial costs of producing and delivering courses and non-credit programming. This is in keeping with the experience of every distance education telecommunications network established over the past ten years.

Various ways to obtain both capital and operational funding must be explored. It is clear that current funding for AIHEC colleges cannot be used to activate the network. Diminishing or redirecting these funds could mean the loss of the very institutions the AIHEC network is intending to help. AIHEC colleges will not be able to pay more per student for network-delivered courses than they are currently paying now for campus and adjunct professors. With this as a guide, funding will be sought from government, corporate and foundation sources to meet the programming and network operational needs of AIHEC-member institutions.

It may be that Congress would elect to waive the matching requirements for the PTFP program, in order that the equipment portion may be purchased for the first phase. But, in the event Congress elects not to take that action, a special appropriation would be required for equipment as well as personnel and operations. The Clinton Administration has most recently proposed $64 million in supplemental funding for PTFP for fiscal year 1993 for purposes of national telecommunications infra-structure planning and construction. AIHEC will explore the possibility of requesting the $2.1 million under this supplemental appropriation.

With the network foundation in place, the AIHEC and its individual member colleges will approach other funding sources for program and expansion support. These sources will include a number of federal agencies already involved in funding programs to meet the educational and informational needs of Native Americans (e.g., the National Science Foundation, and the U.S. Departments of Health and Human Services, Education, Interior, Energy and Commerce), as well as the PTFP program in subsequent years. In addition, several foundations and corporations are now funding educational technology initiatives serving students and faculty in difficult to reach, rural areas; these organizations will be approached by the AIHEC network in coordination with participating colleges to address specific programmatic needs.

Second Year Planning Will Accomplish Five Objectives

Congress has appropriated funds for a second planning year to enable AIHEC to complete its planning for a comprehensive telecommunications network. Five specific objectives have been adopted by the AIHEC Board of Directors for this second year:

- To develop a customized long-term plan to suggest improvements to each AIHEC college's local educational telecommunications needs, and to extend AIHEC distance learning network programming from each AIHEC college's main campus reception point to other campuses and community reception points, as well as to interconnect with in-state telecommunications systems;

- To generate actual academic and operational experience through pilot delivery and use of at least two telecourses in each of two successive terms;

- To gain additional experience through delivery and employment of at least three satellite teleconferences presented in cooperation with one or more Native American service agencies;

- To develop informational materials describing the new AIHEC distance learning network and seek external capital and operational funding to see the network become a reality; and

- To develop a specific plan for the continued development and management of the AIHEC Telecommunications Network, including permanent and interim (if necessary) location of centralized administrative offices with uplink and production facilities appropriate to support the national network.

With the benefit of research about the needs of AIHEC colleges and the potential of a telecommunications network to serve all of Indian Country, and at the direct request of the AIHEC college academic deans, the AIHEC Board of Directors toward the end of the initial planning year adopted the following mission statement to guide the development of an AIHEC distant learning network.

AIHEC Telecommunications Project ***Mission Statement:***

"The mission of the AIHEC Telecommunications Project is to develop national and regional interactive telecommunications networks linking the tribal and Bureau of Indian Affairs-operated colleges, universities and schools together to deliver enhanced and expanded postsecondary educational services to Indian people and agencies throughout the United States.* This mission will be accomplished by the existing tribal colleges providing the following types of services via the AIHEC Telecommunications Network:

- Bachelor's and Master's degrees in various disciplines selected in accordance with the needs of the tribal colleges and the Indian employers and communities they serve, as well as all other interested Indian reservations and/or urban Indian Centers.

- Specific courses selected by the tribal college deans, as well as vocational certificates and associate degree programs, to enhance or expand current curricular offerings or allow the tribal colleges to operate more efficiently.

- Specific training, including in-service training and continuing education, designed to meet the needs of Indian agencies or employers throughout the United States.

- Post-secondary educational services for Indian communities not serviced by tribal and BIA-operated colleges and universities.

- Assistance to federal agencies to accomplish their missions efficiently to disseminate information and services to Native American Indian communities throughout the nation via the AIHEC telecommunications network."

*The term "Indian" is defined in accordance with Public Law 98-192.

I. PREFACE

The American Indian Higher Education Consortium (AIHEC) has concluded, through an extensive planning process, that a satellite educational telecommunications network linking the AIHEC institutions to one another and to other institutions of higher education will greatly enhance their ability to provide quality education to their students and the communities they serve. This is seen as a first step in providing a technical and programmatic foundation upon which to add local networks to serve these 27 AIHEC colleges' branch campuses and off-campus sites, as well as to interconnect with in-state telecommunications networks.

This report documents the results of the year-long planning effort which involved at least three individuals at each of the 27 AIHEC-member colleges--the presidents academic deans and designated college representatives--in extensive meetings, campus surveys, and follow-up correspondence. Several outside consultants assisted in this process, including two special advisors from the Public Telecommunications Facilities Program and the Public Broadcasting Service.

In the process of preparing the recommendations that are discussed in this report, two very important developments took place.

First, the academic deans from all of the AIHEC colleges met for the first time ever to focus n curriculum needs and issues of mutual concern. It was clear from the beginning of this two-day meeting that, as a group, these individuals are enthusiastic about the potential of a telecommunications network, but they are also cautious about protecting the individual tribal values and customs that they honor at their individual colleges.

The deans stressed the importance of having each college seek the counsel of its elders and council leaders in developing the network. Towards this end, they adopted a Guiding Philosophy for AIHEC telecommunications planning activities. The guiding philosophy that follows has ben incorporated into the work plan for second year AIHEC planning.

Guiding Philosophy

"To maintain the traditional values and philosophy of Native Americans:

The AIHEC telecommunications network must work to preserve the traditional values and philosophy of Native Americans. The network must seek the guidance of traditional elders. In order to implement this guiding philosophy, the planning project will promote the following activities:

1. Share the project plan and its potential with tribal elders, council chairs, and spiritual leaders, both to develop awareness and secure their counsel and support;

2. Arrange a special satellite teleconference(s) to these groups, presenting and explaining the project and system to viewing groups on campus, where downlinks are available, and encouraging other colleges to take viewing groups to nearby downlinks; and,

3. After the video presentations, which will include a question and answer period, groups at each college campus will discuss the project and the campus coordinators will forward written summaries to the planning project."

The second development came toward the end of the planning year, as the result of a request from the academic deans that there be an overall mission statement for the Telecommunications Planning Project. With the benefit of research about the needs of AIHEC colleges and the potential of a telecommunications network to serve all of Indian Country, the full AIHEC Board adopted the mission statement on the folllowing page to guide the development of an AIHEC distance learning network.

AIHEC Telecommunications Project ***Mission Statement:***

"The mission of the AIHEC Telecommunications Project is to develop national and regional interactive telecommunications networks linking the tribal and Bureau of Indian Affairs-operated colleges, universities and schools together to deliver enhanced and expanded postsecondary educational services to Indian people and agencies throughout the United States.* This mission will be accomplished by the existing tribal colleges providing the following types of services via the AIHEC Telecommunications Network:

- Bachelor's and Master's degrees in various disciplines selected in accordance with the needs of the tribal colleges and the Indian employers and communities they serve, as well as all other interested Indian reservations and/or urban Indian Centers.

- Specific courses selected by the tribal college deans, as well as vocational certificates and associate degree programs, to enhance or expand current curricular offerings or allow the tribal colleges to operate more efficiently.

- Specific training, including in-service training and continuing education, designed to meet the needs of Indian agencies or employers throughout the United States.

- Post-secondary educational services for Indian communities not serviced by tribal and BIA-operated colleges and universities.

- Provision of the AIHEC Telecommunications Network to federal agencies to accomplish their missions efficiently to reach Indian communities throughout the nation."

*The term "Indian" is defined in accordance with Public Law 98-192.

The AIHEC Telecommunications Executive Committee expresses its sincere appreciation to all those who have assisted in the development of this report. The Committee hopes that, as a result of this very successful planning initiative, the exciting potential of an AIHEC distance learning network will soon become a reality.

II. INTRODUCTION & BACKGROUND

In the U.S. Department of Commerce's FY 1992 Appropriations Bill, the Congress provided that "$250,000 shall be available for the American Indian Higher Education Consortium for utilization of telecommunications technologies."* The Congress stipulated that this money be awarded by the Public Telecommunications Facilities Program (PTFP), which is administered by the Commerce Department's National Telecommunications and Information Administration (NTIA).

> "American Indian Higher Education Consortium
>
> The Committee has included $250,000 for the American Indian Higher Education Consortium to develop a plan that would identify how the 26 tribally controlled and Bureau of Indian Affairs colleges can more effectively achieve their mission through the utilization of telecommunications technologies. In developing the plan, the grantee will analyze the needs identified by the colleges, review applicable technologies and program sources, and detail costs and benefits in the context of the required services. This study, which should be undertaken in continuing consultation with the National Telecommunications and Information Administration and the Public Broadcasting Service, is to be delivered to the Secretaries of Commerce, Interior, and Education, and to the committees of the Congress having jurisdiction over Indian education and telecommunications within 1 year of the effective date of the grant."

This directive provided the American Indian Higher Education Consortium, Inc. (AIHEC) an important opportunity to undertake a serious and systematic feasibility study, and to develop telecommunications technology plans to assist the two and four year member colleges to improve campus teaching, enrich and broaden curriculum opportunities for their students, and further assist the tribal communities they serve.

To oversee the Project and its development, the Board of Directors formally activated a Telecommunications Executive Committee. Six presidents were appointed from the AIHEC Board to form the Committee:

- Robert Lorence, *Chairman*
  President
  Northwest Indian College
  Bellingham, Washington
- Carlos Cordero. President
  D-Q University
  Davis, California

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*From Departments of Commerce, Justice, and State, The Judiciary, and Related Agencies Appropriations Act, 1992, Pub. L. 102-140 (Oct. 28, 1991) 105 Stat. 804-805.

- Gwen Hill, President
  Sisseton Wahpeton Community College
  Sisseton, South Dakota

- Martha McCleod, President
  Bay Mills Community College
  Brimley, Michigan

- Ron McNeil, President
  Standing Rock Community College
  Fort Yates, North Dakota

- Peggy Nagel, President
  Stone Child Community College
  Box Elder, Montana

The legislation purposely specified that the study be undertaken with the help of the National Telecommunications and Information Administration (NTIA) and the Public Broadcasting Service (PBS), in order to take greatest advantage of the telecommunications expertise represented in both organizations.

Between October, 1991 and April, 1992, an extensive series of meetings and planning discussions were held. A twelve month AIHEC planning project application was prepared, detailing Project objectives, organization, procedure, timeline, milestones and budget. The legislation designated the Department of Commerce to administer the planning funds. The Department's National Telecommunications and Information Administration assigned operational responsibility to its Public Telecommunications Facilities Program (PTFP).

The application submitted to the PTFP stated that "AIHEC proposes to develop a phased plan to interconnect via an educational telecommunications system all American Indian Higher Education Consortium institutions to improve, through these tribal colleges and Bureau-operated schools, the education, training and way of life of Native American Indians by:

- Self-determining and sharing AIHEC-originated collegiate instruction between institutions;
- Sharing other distant learning programs via satellite or other telecommunications means;
- Sharing tribal information from college to college;
- Providing in-service training for AIHEC educational telecommunications personnel responsible for such inter-institutional and inter-tribal sharing; and,
- Empowering the interconnected system between colleges for AIHEC administrative purposes and in-service training."

On March 3, 1992, the PTFP approved a $250,000 cooperative agreement with the American Indian Higher Education Consortium. The award was formally accepted by AIHEC and the planning project began on May 1, 1992, with a final report to be submitted by April 14, 1993.

This report summarizes the Project's organization, the investigation and planning process, and the assumptions guiding the planning. The report then provides a detailed series of conclusions and recommendations for implementing an AIHEC telecommunications network.

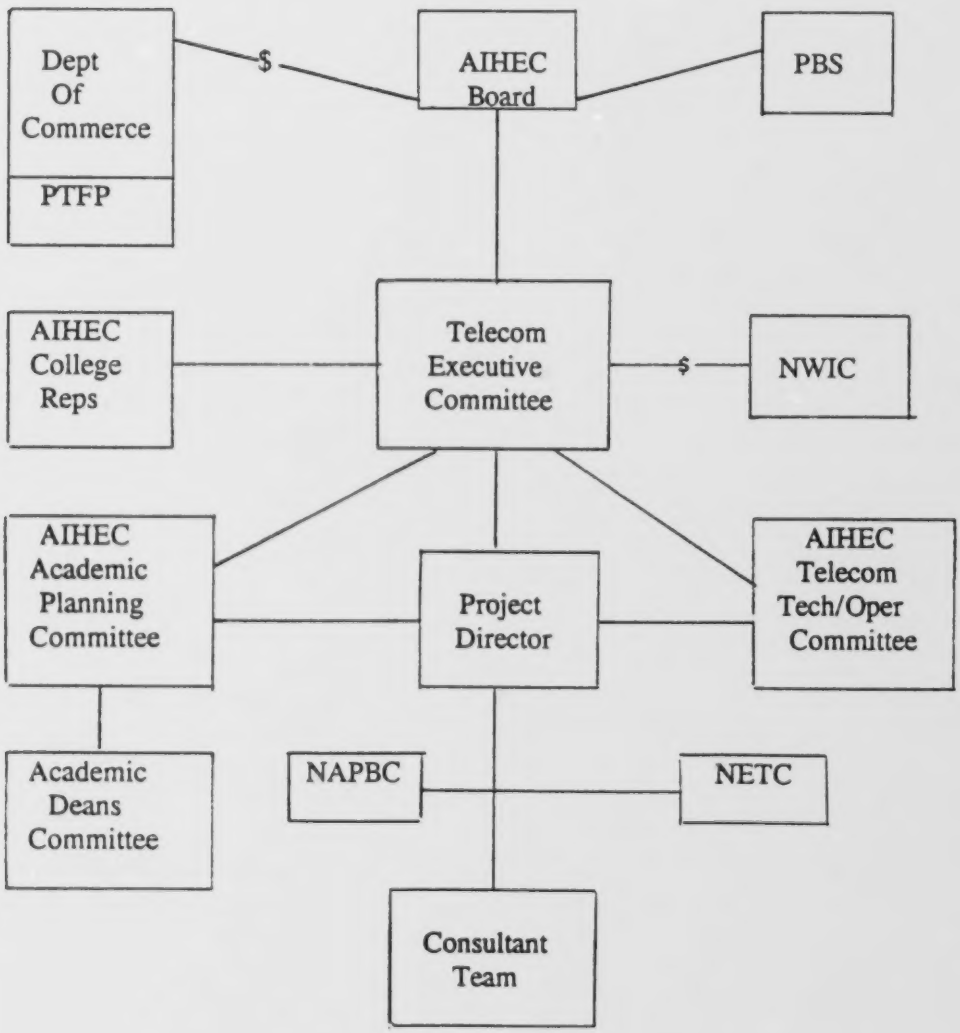
This AIHEC Telecommunications Planning Project Year One final report was formally approved by the Board of Directors at its April 3-4, 1993, meeting in Rapid City, South Dakota. It is respectfully submitted by the Chairman of the AIHEC Board to the Honorable Secretary of Education, the Honorable Secretary of the Interior, the Honorable Secretary of Commerce and to appropriate Committees of Congress, in fulfillment of the federal directive.

III. PROJECT DESIGN AND PROCEDURE

The AIHEC Telecommunications Planning Project has involved a number of organizations, agencies and individuals, in order to take advantage of a wide array of expertise and experience, to ensure widespread involvement and participation of the colleges' administrations, faculty and staff throughout the planning phase, to provide appropriate Project direction, and to ensure accountability throughout the planning year.

The chart and the descriptions below illustrate reporting responsibilities and summarize Project organization for each of the entities and principal Project individuals involved in this study.

TELECOMMUNICATIONS PLANNING PROJECT



AIHEC, Inc.

The non-profit AIHEC Corporation is signator to the Department of Commerce cooperative agreement and recipient of the planning grant. The Consortium's Board of Directors are the presidents of each of the 27 member colleges. A 27th college, Institute of American Indian Arts, Sante Fe, New Mexico, was admitted to AIHEC membership during the Planning Project and is being included in networking plans. The Board has ultimate legal as well as policy responsibility for the Project. *Appendix A* lists the Board members and officers from AIHEC colleges located in 11 states.

Department of Commerce/PTFP

Funding for the Project was provided by the Public Telecommunications Facilities Program (PTFP) of the National Telecommunications and Information Administration (NTIA), U.S. Department of Commerce through a cooperative agreement. PTFP has provided continuing consultation throughout the Project through its director, Dennis R. Connors, and its assigned program officer, Richard P. Harland. PBS has also provided continuous consultation throughout the planning grant through its Education Division. Facilities and other support services have been made readily available. Its Vice President for Education Project Development, Ms. Jinny Goldstein, was designated to represent PBS at all planning meetings and discussions.

Telecommunications Executive Committee

The AIHEC Telecommunications Executive Committee, as empowered by the Board, employed the project director and the consultant team, developed the Project's organizational structure, and has overseen all aspects of the planning process.

Northwest Indian Community College (NWIC)

Federal funding for this planning has been administered for the Consortium by this AIHEC member college, serving as fiduciary agent. Telecommunications Executive Committee Chairman Robert Lorence is also president of NWIC. All expenditures have been approved and reimbursements provided through this fiduciary agent.

AIHEC College Representatives

Each AIHEC college appointed a representative to serve as its liaison to the planning project. *Appendix B* provides a list of those individuals who served as a critical link between the Project and the colleges' faculty and staff.

AIHEC Academic Planning Committee

Academic deans from five AIHEC colleges served on this Committee to provide advice and counsel concerning the academic needs and interests of the tribal colleges. Committee members (*Appendix C*) assisted in developing a facilities inventory survey and agendas for project planning meetings, and interfacing with their counterparts at other colleges.

Academic Deans Committee

At their recommendation, the five member Academic Planning Committee was expanded to become an Academic Deans Committee, upon recommendation of the Planning Committee. The new Deans Committee, composed of the academic heads of all AIHEC colleges *(Appendix C)*, provided valuable advice regarding a full range of academic and operational issues.

AIHEC Telecommunications Operations Committee

Five individuals served as telecommunications operations advisors to the Project (*Appendix D*), working with the project team in designing a facilities inventory survey, reacting to draft reports and advising the project team.

Project Director

Following a national search, the Project was fortunate to secure the services of an experienced Native American administrator, Mr. Ed Lone Fight (*see Appendix E*), to head the Project planning team from the headquarters of the Native American Public Broadcasting Consortium in Lincoln, Nebraska. Reporting directly to the Telecommunications Executive Committee Chairman, the project director worked closely with the project consultants in planning and conducting the feasibility study, hosting meetings and preparing reports. He provided valuable service to both the Project and AIHEC college representatives, visiting each campus and maintaining regular contact and correspondence with everyone involved in the Project.

Native American Public Broadcasting Consortium, Inc. (NAPBC)

On behalf of the AIHEC Project, NAPBC was appointed to assemble a consultant team to assist in the study. Located at the Nebraska Education Telecommunications Center, this non-profit corporation, supported by the Corporation for Public Broadcasting, brought its educational telecommunications program, production and administrative experience to the Project through its Executive Director, Frank Blythe, who served as a member of the consulting team.

Nebraska Educational Telecommunications Center, (NETC)

NETC General Manager Jack McBride served the AIHEC Telecommunications Planning Project as consulting project director. This brought the extensive educational telecommunications experience and resources of NETC to the Project.

Consultants

Two additional consultants, also with national reputations and distance learning expertise, completed the project team. Dr. Gail Arnall, President of Phoebus Communications, Inc., provided valuable curriculum, programmatic, operational and fiscal consultation throughout the Project.

Philip Rubin, President of Rubin, Bednarek and Associates, Inc., brought his national/international engineering expertise to assist with the technical aspects of the Project.

The AIHEC Project was thus able to benefit from the combined experience of Arnall, Rubin and McBride, who have previously helped develop five currently operating and successful distance learning telecommunications networks.

Project Design and Procedures

The decision was made at the outset to divide the AIHEC Project into two phases: a May 1 through September 30 organizational/developmental phase; and an October 1 through April 14 inquiry and planning phase.

A detailed Project timeline together with a set of Project milestones was developed and periodically revised and expanded, based upon experience and need. The final Project timeline and milestones are exhibited in *Appendix F*.

It was determined at the outset that, in addition to developing an appropriate telecommunications plan to serve Native American colleges, the project team should provide educational materials about educational telecommunications and distance learning to AIHEC colleges' faculty and staff on an on-going basis. Toward this end, literature was gathered and shared, special materials were developed, including information about successful national distance learning networks, special video materials were developed, and four interactive satellite teleconference demonstrations were produced.

Because a federally-funded telecommunications project in 1987-89 involved AIHEC colleges' faculty and staff only minimally, it was determined at the outset that this Telecommunications Planning Project would deliberately, and in as many ways as possible, involve Native American college administrators, faculty and staff in all aspects of the planning process. As the result of this decision, during the twelve months of planning:

- A Native American served fulltime as Project Director;
- An Academic Planning Committee and a Telecommunications Operations Committee were activated;
- Each college appointed a campus representative to the Project;
- The Academic Planning Committee met early in the Project to plan the AIHEC Telecommunications Planning Project Conference; the two-day conference included one to three representatives from 25 of the 27 AIHEC colleges;
- Twenty-two of the colleges were visited by one or several Project team members;
- A Telecommunications Facilities survey was completed by each college;
- Twenty-four of the 27 colleges held a campus Project workshop, using special video and print materials provided by the Project;
- An academic needs assessment was completed by each college;
- Project campus representatives and administrators met for a second time adjacent to the National Indian Education Association's 1992 annual meeting, and a special Project teleconference was presented at the NIEA meeting;
- The Telecommunications Operations Committee met face-to-face to review the Project's telecommunications facilities needs;
- AIHEC college academic deans met for the first time ever, as the result of the Project, where they reviewed needs assessment data, and drafted conclusions and program service recommendations;
- NAPBC/NET Project Team representatives met six times with the AIHEC Telecommunications Executive Committee; and,
- The Executive Committee Chairman presented progress reports regularly to the AIHEC Board of Directors.

In addition, during the April 1992-February 1993 period, the Project Team developed a series of seven interim Project reports designed to:

- Provide further information about distance learning via telecommunications;
- Share information about successful distance learning networks and their program services;
- Provide more detailed explanation about the AIHEC Telecommunications Planning Project, its objectives, procedure and timetable;
- Provide technical information about alternative technologies, equipment and facilities;
- Stimulate discussion concerning alternative approaches; and,
- Begin to secure consensus.

Multiple copies of each of the following interim reports were provided to each college, with distribution to the president, academic dean, campus representative and telecommunications committee members, and with the suggestion that copies be widely shared with other faculty and staff:

Interim Report #1: *Project Organization, Activation and Program Planning*. This report provided an introduction to the Project, its objectives, organizational chart, summary of the initial academic planning committee meeting, summary of the AIHEC telecommunications planning conference, summary of the planning procedures and timeline, and listings of all AIHEC college representatives involved in the Planning Project.

Interim Report #2: *Interconnecting the AIHEC Colleges: A Comparison of Alternative Telecommunications Delivery Technologies*. This report included a detailed analysis prepared by the Planning Project's technical consultant, reviewing all telecommunications technologies, the nature of interconnected services, alternative telecommunications delivery technologies. The attributes and advantages and disadvantages of eight specific technologies were detailed, with a recommendation for the most desirable technological means for interconnecting the geographically separated AIHEC member institutions.

Interim Report #3: *Campus Telecommunications Facilities Profiles: the Current Capability of AIHEC Colleges*. This report summarized information collected from each college's facilities survey, and provided a profile of the existing telecommunications equipment and facilities available at each of the AIHEC member colleges.

Interim Report #4: *Campus Workshop Summaries*. This report summarized the results of campus workshops, involving faculty and staff, as held on various campuses to explain the Project and distance learning via telecommunications.

Interim Report #5: *AIHEC Colleges: Potential Telecommunications Networking System*. This report addressed technical interconnection and network design considerations, a proposed technical design for the network, including reception equipment, a basic distance learning reception classroom, program production capability, two options for TV origination classrooms, and two options for satellite transmission.

Interim Report #6: *Types of Services and Program Sources*. This report described eight different types of programming possible on the network, together with advantages, disadvantages and conclusions.

Interim Report #7: *Academic Needs Assessment Survey Results*. This report summarized the results of a detailed academic needs assessment survey conducted at each of the AIHEC colleges, and treated a variety of important academic and operational considerations relevant to distance learning networking and credit course and non-credit program sharing.

These interim reports proved helpful in orienting college personnel on each campus to the Project, to distance learning, to the complexities of telecommunications, to the technical considerations inherent in program origination, reception and networking, and to alternative approaches and associated costs.

These reports, together with quarterly performance reports, served as Project deliverables to PTFP. Copies of the interim reports are available from the Project Office in Lincoln, Nebraska.

IV. TELECOMMUNICATIONS PLANNING ASSUMPTIONS

The use of educational telecommunications by AIHEC colleges varies widely. Nine institutions have some amount of video production facilities. Nine colleges use classroom computers extensively. Fourteen colleges have satellite receive equipment, indicating a certain level of satellite literacy and experience on campus; but, in many cases, this equipment is not available for use in an AIHEC Network. It is owned by some other entity or it is in disrepair. A few other institutions have recently installed equipment or are planning such facilities. The vast majority of AIHEC colleges, however, do not as yet have the means to employ telecommunications for distance learning.

Installation, operation and use of television and telecommunications are not inexpensive. But, the benefits can be considerable, and can serve in major ways to improve both teaching and learning. Benefits from the considerable capital and operational costs can be derived by using the facilities both to serve campus and local tribal community needs and, more broadly, by pooling and sharing resources in various combinations with other educational institutions.

The AIHEC Telecommunications Project team, therefore, studied both the benefits of using educational telecommunications at the individual college level, as well as between institutions to share faculties, courses and programs.

Project research, literature, campus visits, discussions and meetings have made the Project team acutely aware of the firm independence and autonomy of each AIHEC member college. The five year plan referenced in AIHEC's Project PERMA (Promoting Environmental Restoration/Management for American Indians) directly addresses this important characteristic. The authors of the plan put it well when they stated that all interested in AIHEC and the Native American tribally-controlled colleges:

> "Should be cognizant that, while AIHEC attempts to organize common programming, it is not a system of related institutions. Each campus is an autonomous organization, with its own board of trustees, its own policies, and its own administrative protocols. By design, there can be no centralized "AIHEC policy directives" or "AIHEC mandated programming" prescribed to the member campuses. The individual member campuses of AIHEC are free to participate (or not) in any Project and to any degree. Individual member campuses have their own established campus needs and priorities. To the extent that AIHEC, as an organization, offers and suggests programs and opportunities of interest to its member institutions, a campus may or may not choose to subscribe. At all times, an individual campus is free to implement program at its own pace, with its own design, with specific and localized goals, without regard for entity other than its own board and Tribal Elders."

It is within this context that any educational telecommunications network must operate. The Project Team has identified certain additional stipulations or "givens" that should also be addressed if AIHEC colleges are to achieve maximum benefit from telecommunications and share scarce resources. These include:

- Tribal Differences: The significant differences between tribes and their tribal colleges in terms of their culture, traditions and languages must be kept in mind at all times;

- Economies of Scale: Through consortia development and acquisition of programming and pooling of resources, the collective numbers of students/viewers and cost sharing can make programming delivered via telecommunications feasible for individual colleges;

- Native American Control: The scheduling, selection and program distribution of any telecommunications system developed must be determined by Native Americans;

- External Funding: The building and operation of any networking system can become a reality *only* if additional funding from outside sources can be generated for purchase of capital equipment and operation of the system, since AIHEC colleges currently have so many educational needs and such limited resources;

- Phased Development: The plan developed must be prepared in stages, with a series of building blocks, each a systematic expansion on the others, so that, as resources become available, origination and reception systems can be logically expanded and program distribution and exchange capability can be increased. This approach anticipates pilot demonstrations and development of experience;

- Equitable Treatment: All members of the Consortium must be included in the development of any such plan and must be treated equally;

- New Technology Anticipation: Any telecommunications system developed must take into account the latest and ever-advancing and improving telecommunications technologies, and make provisions for their ultimate addition, as well as the appropriate mix of technologies;

- In-State Linkage: Since educational telecommunications development continues in each of the states where AIHEC institutions are located, individual telecommunications plans must ensure ultimate linkage of each AIHEC college to its developing state networking plans;

- Program Origination: Certain AIHEC colleges will need to be able to produce and originate audio/video programs in order to service their campuses and tribal community reception sites, as well as fulfill requests for programming that AIHEC may make. Other institutions will initially require only reception capability until such time as interest and resources increase;

- Cultural Awareness: Because of tribal differences, sensitivity to program contents and scheduling is required at all times, and especially to the use of educational programming produced and made available by non-Indians;

- Regional Clustering: Opportunities must be provided for pooling resources and sharing programs with AIHEC colleges within an individual state, or regionally on a less-than-full network basis, recognizing that very few programs and courses will be universally employed by all AIHEC institutions;

- Servicing Local Constituencies: Telecommunications plans must be developed that allow opportunity to share educational programming, particularly the non-credit variety, with off-campus tribal constituencies;

- Staffing and Training: Staffing needs, in terms of operations and maintenance, must be recognized and addressed, as well as the need for continuous in-service training;

- User-Friendly Equipment: Turnkey equipment installations and designs that make operations as non-complex and free of errors as possible will be required; and,

- Network Uniqueness: No two educational telecommunications networks are exactly alike, as each must be tailored to the particular educational needs and objectives of the target clientele.

The Project Team has sought to ensure that each of the above assumptions has been taken into consideration and addressed in this report.

V. PROGRAM CONSIDERATIONS, NEEDS AND RECOMMENDATIONS

Representatives from each AIHEC member college participated extensively in assessing the academic and programming needs that could be addressed via a distance learning telecommunications network. The information provided in this section summarizes the findings from three sources:

- Interim Report #6 on the various types of services and program sources;
- Interim Report #7 on the results of the academic needs assessment survey; and,
- A two-day meeting of AIHEC academic deans--the first meeting ever held involving all of the academic deans, during which the deans went over two reports in detail and discussed academic needs and other issues common interest.

Key Findings of Needs Assessment Survey and Deans' Discussions

Responses to the needs assessment survey (Interim Report #7) and the Academic Deans' Meeting indicate that the AIHEC colleges are very interested in participating in the development of a telecommunications network. The network must be designed to guarantee the flexibility for each AIHEC member college to meet its own instructional needs. And, the network design must speak specifically to each member college's capability to develop its own sites for the areas which the college serves.

One of the key findings emerging from the Academic Deans' Meeting is the knowledge that several AIHEC colleges are already involved in telecommunications-related projects. These colleges are already beginning to see how an AIHEC telecommunications network could tie into their existing programs. Further, it was clear that the experiences of these colleges will be quite valuable in planning implementation phases for the AIHEC-wide project to reflect the unique needs and interests of Native American students.

This response from the deans corresponds to the survey results in which many respondents stated they can provide resources, equipment, expertise, and other resources to help establish and operate the network. From the survey and the deans' discussion, it appears that many of the colleges have strengths in a wide range of areas. It may be possible for the different colleges to complement one another in many ways. For example, at least three colleges have extensive amounts of video footage taken over the course of several years documenting tribal celebrations and customs. Although this material would need editing and indexing, and copyright issues would need to be addressed, it is possible that some of this material could be used in the development of courses and special programs for sharing among the colleges.

The academic deans stressed the importance of having each college seek permission from their elders and council leaders, so that the telecommunications planning project develops in the right way. The spiritual dimension of the project was seen as critical to its success. At the two-day meeting, the deans adopted a guiding philosophy for the project and the implementation of a telecommunications network:

Guiding Philosophy

"To maintain the traditional values and philosophy of Native Americans:

The AIHEC telecommunications network must work to preserve the traditional values and philosophy of Native Americans. The network must seek the guidance of traditional elders. In order to implement this guiding philosophy, the planning project will promote the following activities:

1. Share the project plan and its potential with tribal elders, council chairs, and spiritual leaders, both to develop awareness and secure their counsel and support;

2. Arrange a special satellite teleconference(s) to these groups, presenting and explaining the project and system to viewing groups on campus, where downlinks are available, and encouraging other colleges to take viewing groups to nearby downlinks; and,

3. After the video presentations, which will include a question and answer period, groups at each college campus will discuss the project and the campus coordinators will forward written summaries to the planning project."

There is a general feeling that, if a telecommunications network is developed, the colleges should *actively* participate in the design and implementation to ensure that:

- o programming is appropriate to Native American needs and individual tribal values and customs;
- o the network has interactive courses; and
- o AIHEC colleges take part in producing courses and training.

In other words, the AIHEC colleges do not want only to become good receivers and listeners. They want self-determination for both the development and distribution of programming.

Based upon the results of the academic needs survey and discussions at the academic deans meeting, the following educational and informational needs facing AIHEC colleges and their surrounding tribal communities were most commonly identified:

- Undergraduate credit courses in:
  - advanced math and science including natural resources and environmental studies;
  - business and business administration;
  - nursing and other health-related subjects--specifically third and fourth year courses not available at the two-year AIHEC colleges;
  - tribal languages;

alcohol and drug abuse; and
elementary and secondary education--specifically third and fourth year courses not available at the two-year AIHEC colleges

- Graduate degree programs in:
  education;
  business administration; and
  health-related areas
- Non-credit programs for:
  fundraising;
  writing skills;
  self-improvement skills;
  alcohol and drug prevention;
  training in the use of telecommunications and computers; and
  in-service training for staff and faculty
- Administrative communications between and among:
  AIHEC presidents, deans and other key colleges administrators;
  Tribal leaders; and
  Other Indian-related agencies and programs.

These needs can be met by several different types of programs and course, outlined below. The academic deans will work together to develop procedures for identifying specific courses and programs that should be delivered on the network, and for selecting who is best able and most qualified to produce them.

Types of Services and Program Sources

Eight potential types of programs and program services were identified and described in Interim Report #6 as useful to an AIHEC distance education telecommunications network. The advantages and disadvantages of each were discussed by the academic deans. It is likely that no single college will be interested in producing or even using all of the types of programs initially. The value in having a network, however, is that individual institutions can select what is most valuable at any given time to meet the individual college's goals and missions. The eight types of programs and services are:

o Pre-recorded Credit Telecourses: Complete and integrated instructional packages that include television programs, a textbook, and a variety of other instructional materials, all prepared with extensive academic review designed to meet standard requirements for a college-level semester course. The adoption of a telecourse for credit by a college must allow sufficient time for a review of the materials by faculty to ensure that they meet set academic standards, to determine if and how the course content would need to be adapted, and to insure that library materials were readily available to support the course. Typically, colleges pay a licensing fee of $300 to $500 per semester, plus a $15 per student fee to use a telecourse. The college must also arrange to receive the telecourse via satellite or, if available, from a public television station. PBS and the Annenberg/CPB Project have agreed to waive

the licensing and student fees for their telecourses for a pilot period, so that colleges can gain experience using the materials either as fully-accredited courses or as supplemental material to campus courses. A significant consideration is the fact that faculty would still have to be involved to help the students with the content of the course, because there is no interactivity among the colleges and between students and instructors for this type of course.

- o Live, Interactive, Satellite-delivered Credit Courses: Complete, fully accredited courses delivered with one-way video and two-way audio in "real time," so that the course instructor can talk with each of the students taking the course, no matter where they are located. Satellite networks serving K-12 are growing rapidly as a way to solve the equity issue for rural and small schools. College networks are increasing, but with much more specific mandates. For example, the National Technological University offers graduate degrees in computer science and engineering; AG*SAT offers credit courses in agriculture. This type of programming offers AIHEC members the opportunity to design courses specifically for Native American students, taking advantage of their cultural backgrounds, learning styles and educational experiences. AIHEC colleges may have even more problems in scheduling live courses than is typically the case because of the flexibility they must have in serving the special needs of their students. The cost of designing and delivering live, interactive courses is substantially greater than using pre-existing courses, but this type of programming is likely to be the most useful for the colleges. (See *Appendix G* for information on the costs that other networks face in delivering these types of courses.) Outside funding will need to be found to support research, development and delivery of these types of courses.

- o Videoconferences: Non-credit programming delivered live over the satellite, by one-way video and two-way audio, so that viewers in locations around the country can talk to the presenters and to one another during the program. Videoconferences are most effective when viewers need to hear from leaders in their field but cannot afford to travel to conferences, and when viewers need to have information in a timely manner. Local facilitators are increasingly used to lead discussions at the local site about the information presented in the videoconference. Some videoconferences produced by others can be used by AIHEC colleges with no charge. Other videoconferences cost between $100 to $350 per site. Significant discounts are usually available for consortia buys, however, reducing the fee the individual college would have to pay. In addition, of course, videoconferences can be designed by and for AIHEC faculty, staff and students, to address their unique needs and interests. These videoconferences could cost between $3,000 to $40,000, depending upon content and production requirements. Questions of fees, the applicability of existing videoconferences and the on-site duplication of print material will have to be addressed, probably on a case-by-case basis.

- o Existing AIHEC Courses: Courses designed with technology in mind, or courses that have been designed specifically for Native American students but

would have to be prepared for delivery over the Network. This program type offers one of the best ways, long-term, for the colleges to expand their curriculum offerings. This is especially true for the two four-year AIHEC institutions that might be asked to help develop third and fourth year courses in specific curriculum areas for distribution to the other colleges, so that students would not have to leave their reservations in order to finish their baccalaureate degrees. A few AIHEC colleges have experience now in developing and delivering courses for use within their region or state, so these colleges may take the lead in developing these types of courses. In addition, several colleges have existing video footage that might be used to enhance courses at other colleges. It is recognized that no one course will be of interest to all colleges, so an effective way of selecting courses will have to be developed. The assumption is that, with appropriate technology in place for originating and receiving courses, it would be very cost-effective to begin sharing courses among the AIHEC colleges on an as-needed basis. Currently, for example, AG*SAT course producers budget $45,000 per course ($1,000 per instructional hour); AG*SAT pays them $15,000 and they make up the difference with grants and on-campus student registrations. As mentioned above, funding for research, development, production and delivery of the courses would be required from outside sources.

- Future AIHEC Courses: New distance learning courses developed as a result of the needs expressed by several colleges due to: changes in their curriculum; needs expressed by non-student populations on the reservation for continuing education; demand for remedial courses and programs; and interest in an Indian Culture course co-produced by several colleges willing to teach their specific tribal customs, language and traditions. Several of the concerns and constraints discussed concerning delivery of existing courses apply to this program type as well. Developing any mediated course requires considerable study, planning, time and financial resources, to do them well. Although the curriculum might be already developed, considerable training and planning would be required to take full advantage of the technology. The use of computer interactivity is seen as a strong advantage as these courses are developed. Development and delivery of new AIHEC distance education courses will depend upon having reception and program origination equipment in place, and securing outside funding to support the new programs.

- Faculty and Staff In-Service and Continuing Education: Course-work brought to the campus leading to advanced level masters or doctoral degrees, as well as videoconferences of interest to faculty in specific curriculum areas. Some existing courses and videoconferences already distributed via satellite by other networks may be of interest to AIHEC faculty and staff. The consortium can negotiate with these existing services for reduced fees, so individual colleges will not have to pay the single-site fees. Meanwhile, AIHEC colleges themselves can develop in-service programs and master's level course work as the need arises. For example, there is the shared concern that non-Indian faculty would benefit tremendously by having in-service training programs on

Native American history, culture and customs. And, although each college represents very distinct tribal traditions and customs, there would be great benefit in having faculty know more about the various tribes and Indian history in general. Most of the academic deans feel that the real benefit of the network, at least initially, will be the ability to provide in-service training for staff and faculty. This is a more efficient way to train compared with having staff and faculty travel to a central location. These types of programs will not have to meet accrediting standards, and relatively small audiences can be served in a cost-effective, timely manner once the equipment is in place. It is anticipated that a videoconference for AIHEC deans, for example, could be offered by one of the AIHEC colleges for less than $1,000, once the equipment is in place.

- Programming for Tribal Community: Videoconferences originating from a variety of sources and useful to tribal council members, spiritual leaders, K-12 educators, Indian health workers, tribal judges, law enforcement officials, and others on the reservation. The assumption is that although there may be some existing programs already on the satellite that may be of interest, especially for K-12 educators, most of the programming will need to be developed in consultation and cooperation with a variety of agencies and organizations. These organizations will involve: the Indian Health Service; various offices within the Bureau of Indian Affairs; several judicial organizations and the associations of tribal leadership; and existing programs such as PERMA (Promoting Environmental Restoration and Waste Management for American Indians) and AISES (American Indian Science and Engineering Society). In addition to live, interactive videoconferences, the network could initiate programs that might result in continuing discussion forums via computer conferencing. There is recognition that funding for this type of programming can come from a variety of sources, including the various agencies and organizations like those mentioned above that need to have information disseminated. In some cases, the funding would be seen as a contract for services (saving an agency travel and other expenses) rather than an underwriting grant. This type of program offers reservations the opportunity of sharing resources, knowledge and experience in ways that are simply not possible now. Joint projects between tribes and between tribes and their colleges could be initiated. The lack of receiving and program origination equipment is the primary barrier to making these advantages a reality.

- Administrative Uses: A technological means of creating "people networks" among individuals at various levels on the AIHEC college campuses. There is great interest in using the Network to link AIHEC presidents (to help cut down travel time and expenses) and AIHEC deans, to facilitate inter-library loans, and to provide training in telecommunications/computer equipment software. It is likely that the administrative uses of the network would include videoconferencing, audio conference calls and computer networking in the years ahead. Once the network is in place, the costs of operating the system would be much less than having people travel to meet their counterparts. In other

words, considerable savings can be realized without sacrificing the opportunity for colleagues to communicate with one another. Meeting face-to-face is critical, so the network would not want to eliminate totally staff travel to meetings and conferences. But, these experiences can be enhanced if staff members are able to stay in touch on a regular basis to extend the in-person learning experience and plan additional joint projects.

Investigation and discussion have determined that each of the eight program types and program services will be most beneficial to AIHEC and its member institutions. The production costs of these program types and services can vary widely, depending upon a range of factors. For reference purposes, several sample budgets are provided in *Appendix G*.

Issues Surrounding Accreditation

Several accreditation issues need to be addressed, especially if degree granting programs are presented on the network. Representatives from the Northwest Association of Schools and Colleges and the North Central Association of Schools and Colleges were very encouraging at the deans' meeting about the use of technology to expand the curricula at AIHEC-member colleges.

The growth in distance education is coming at a time when considerable discussion is taking place in all of higher education about how education will be delivered in the next twenty years, and how to measure what students are learning. In the short term, accreditors will continue to look at control. Who is making the decisions? Who is developing the curriculum and the teaching? Why are they appropriate? Who gets the credit and on what basis? Who approves and evaluates the offering on each campus. Accrediting agencies will get involved only at such time as a large percentage of a degree program is delivered via technology; they will not be looking at situations where only a few courses are involved. Meanwhile, the credentials of the faculty should be high and documented; the courses taken must fit into the mission of the college and the specific degree program; student-to-student interaction must be facilitated; and library support materials for courses must be readily available--although not necessarily physically located at the student's campus.

It was strongly recommended that AIHEC stay in touch with groups already involved in distance education, and participate actively in the NTIA-supported study of technology under the direction of the Council of Chief State School Officers.

Training for TV Teachers and Classroom Instructors

It is clear that faculty will need to be trained to teach effectively using the technology. Several of the colleges are already gaining experience in teaching via television and computers; their experience will be the first source of training for other AIHEC colleges. Some of the training can take place on the network itself, but it is assumed that as the Network begins operations, specific in-person training opportunities will need to be offered for those who are preparing courses and videoconferences for network distribution.

Credit courses, as well as non-credit programming, will require an instructor in the classroom or local viewing site. Specific instructions for these individuals will be required in order to take advantage of their contribution to the learning process. For the credit courses where the same class will meet over the course of a semester or quarter, training for the classroom instructors can take place using the network itself. So, for example, a week before the course begins, the classroom instructors can gather via the Network so the TV teacher can outline the course and highlight any special role that the classroom instructor will have. It is anticipated that each college will have a program coordinator who will serve as the facilitator for most of the non-credit programming (see Section VII: Operational Considerations and Recommendations). This individual can also be trained via the network, with periodic updates or reviews as needed.

Each course and program on the network will share many of the same characteristics, but there will always be unique features. The technology will allow each course producer to be imaginative and creative in putting the course or program together. The more the teachers and presenters know about the technology, the more effective they will be in creating the best possible learning opportunities for students and viewers.

Summary of Program Recommendations

- Several AIHEC colleges are involved in telecommunications-related projects; the AIHEC Telecommunications Network will build upon this experience during the initial years of operation.

- Each college should seek the counsel of elders and council leaders so that the telecommunications project develops in the right way; the spiritual dimension of the project is critical to its success.

- The academic deans will work with the network staff to develop undergraduate courses in advanced math and science, business, nursing and other health-related subjects, tribal languages, alcohol and drug abuse, and elementary and secondary education; graduate courses in education, business administration and health-related areas; non-credit programming--especially faculty and staff in-service training; and administrative videoconferences for campus and off-campus populations,.

- The network will offer eight types of services and program sources to AIHEC colleges; pre-recorded credit telecourses; live, interactive satellite-delivered credit courses; videoconferences, existing AIHEC courses; future AIHEC courses; faculty and staff in-service and continuing education courses and programs; programming for tribal communities; and programming for administrative uses.

- Training for TV teachers and classroom facilitators is a must if the network is to be received well on each campus.

- The question of which courses and programs to offer is not simply a function of need, although that question is paramount. It is also a question of who is qualified to offer a course, what is the cost, how will it be produced, when will it be scheduled, and how will it be funded. Many more discussions must take place, particularly among the AIHEC academic deans, as plans progress.

VI. TECHNICAL CONSIDERATIONS & RECOMMENDATIONS

AIHEC colleges can employ the eight identified program types and program services most effectively through joining together and pooling resources. With the severe constraints currently placed on individual Native American college budgets, with such limited resources available, with constantly increasing costs, and with the incessant needs that face all of higher education to provide more and better instruction, the most likely way AIHEC colleges will be able collectively to effect improvement will be through the sharing of program resources between and among the institutions. This approach also offers the best opportunity to seek outside support to jointly help each other.

This means, then, *networking*--joining together via modern telecommunications is the most efficient method on a long term basis to enable such distance sharing.

Networking involves four elements or components:

- Program Distribution: Sending programs via electronic transmission to each of the colleges for their individualized use;
- Program Reception: Maintaining the appropriate equipment to receive such distributed programming;
- Program Origination: Producing the programs and program services, or otherwise acquiring programs produced by others; and,
- Coordination: Putting in place the staffing, selecting, scheduling and financing of programs, as well as the organizational procedures within which such collaborative services can most appropriately be provided.

Telecommunications networking and program sharing are both complicated, equipment intensive, and not inexpensive, in terms of both capital equipment needs and annual operations and maintenance. Interim Report #3 detailed the limited extent of capital equipment already in place at various colleges (see *Appendix H* summary). A substantial amount of additional equipment is now needed for networking to take place between AIHEC colleges.

Program Distribution

This section first addresses program distribution between AIHEC colleges, since the distribution technology to be used directly affects both program origination and program reception. Because various electronic communications technologies are available to allow audio/video networking, it was necessary to evaluate the use of each delivery technology and compare their advantages and disadvantages before making decisions.

The planning project was pleased to have as its technical analyst Philip A. Rubin of Rubin, Bednarek & Associates, Inc. of Washington, D.C. Mr. Rubin brought to the study an impressive set of credentials. He has worked as satellite engineer for the Hughes Aircraft

Company, has served as chief scientist for the Corporation for Public Broadcasting, and has designed and serves as chief scientist for the PanAmerican Satellite. His consulting firm has widespread educational telecommunications experience. Mr. Rubin designed the National Technological University networking system and continues as its consultant. He also designed the national Agricultural Satellite Network, called AG*SAT. The firm works with all telecommunications technologies, and custom tailors its designs and systems according to the specific needs of its client.

The AIHEC Project has developed a plan to use telecommunications technologies to interconnect 27 widely separated tribally-controlled and Bureau of Indian Affairs-operated colleges in a manner that provides for:

- The sharing of courses and programs conveniently and economically;
- A significant level of interactivity, enabling students, faculty and administrators to communicate with one another in real time; and,
- Future opportunities for text and data distribution.

The initial need was to develop a plan to provide *first connectivity* to a *main* campus reception site at each of the institutions in the consortium in order to enable program sharing to begin. This was the initial assignment presented to the Project's technical consultant. On August 21, 1992, the consultant provided the Project an analysis report entitled "Comparison of Alternative Delivery Technologies for the AIHEC Interconnection". This report is contained in its entirety in Interim Report #2. Its contents are summarized as follows:

- ***Nature of the Interconnected Service(s)***

If the 27 AIHEC colleges are to be interconnected to share credit courses and other programming, the networking system should look to the future and provide for distribution of both television programs and related telecommunications services. Those services should include:

1. Television programming, with standard quality picture and sound;

2. Standard quality radio programming;

3. The ability in the future to distribute printed text on the television screen, according to the appropriate teletext standards;

4. High speed data to transmit supportive classroom instructional materials and tests for local transfer to hard copy print;

5. Voice communications; and,

6. Audio and video teleconferencing at appropriate compressed transmission rates.

- ***Alternative Telecommunications Delivery Technologies***

The telecommunications interconnection technology selected for the proposed AIHEC network should have the capability of providing all six of the above services.

The first of the six, television, is the most difficult and demanding to deliver, because it has the greatest amount of information to transmit. The following eight communications technologies were systematically analyzed:

1. Terrestrial microwave;
2. Optical Fiber;
3. Video tape delivery;
4. Instructional Television Fixed Service broadcast;
5. Low power television broadcast;
6. Cable television;
7. Telephone lines using video compression; and,
8. Communication satellites.

Each of these technologies is reviewed in the technical consultant's report, with advantages and disadvantages summarized.

- ***The Recommended Interconnection Technology***

The engineering consultant recommends the latest state-of-the-art satellite technology as the preferred communications networking mechanism to meet the particular interconnection needs of the 27 geographically separated, tribally-controlled and BIA-funded Native American Indian colleges. He identified seven specific advantages in using satellite communications technology for the proposed AIHEC network:

1. Expansion Capability;
2. Cost Effectiveness Over All Other Technologies;
3. Technical Program Quality;
4. Predictable Financial Future;

5. User Friendliness;

6. Reliability; and

7. Access to Other Programming.

For these same reasons, six successful distance learning program services are employing satellite communications to interconnect institutions of higher education *(see Appendix I)*

1. The National Technological University (NTU), a national consortium of major U.S. engineering and technology institutions;

2. The Satellite Educational Resources Consortium, a national consortium;

3. The Agricultural Satellite Corporation (AG*SAT), a national consortium of land grant universities sharing credit agriculture courses, cooperative extension programs, and research teleconferences;

4. The Black College Satellite Network, a national consortium of black colleges and universities sharing both courses and programs;

5. The Community College Satellite Network, a consortium of American Association of Community and Junior Colleges sharing teleconferences and programs; and,

6. The PBS Adult Learning Satellite Service (ALSS), a program service offering telecourses and teleconferences to colleges and other receive sites directly via satellite.

All of these networks use point-to-multi-point satellite systems as the preferred distribution system.

In addition, the Public Broadcasting System (PBS) and National Public Radio (NPR) have recently made long term commitments to continue to use satellite technology to interconnect their many public television and public radio stations across the United States.

Several AIHEC colleges expressed the hope that optical fiber could be used for the network, in light of existing or planned fiber optic networks in their states. The consultant analyzed this potential carefully and concluded that *because fiber optic cable is prohibitively expensive, is a point-to-point technology (not point-to-multi-point), and is not widely enough accessible to achieve the desired interconnection of the 27 geographically dispersed AIHEC colleges, it is simply not feasible to consider use of optical fiber.* The AIHEC engineering consultant, with the full support of the Project Director and Consulting Team, *recommends the employment of satellite communications as the preferred technology to provide the basic*

interconnection for an AIHEC telecommunications network.

Interim Report #2 was circulated widely, and its contents were discussed at length. In those discussions, the need for additional technical study became increasingly evident. Many Native American colleges operate with more than one campus; all campuses need interconnection. Linkage with tribal community sites served by the colleges must also be considered. In addition, the colleges must consider linking with nearby sister Indian colleges (in some states) and with in-state non-Indian colleges and universities.

Optical fiber, coaxial cable or other alternative distribution technologies may well be the preferred method for in-state interconnection, conforming with state telecommunications networking systems and future plans. This important additional technical consideration is addressed in Section X: Second Planning Year.

The Telecommunications Executive Committee endorsed the Project Team recommendation to employ satellite technology as the most appropriate and efficient means for interconnecting the 27 geographically dispersed AIHEC colleges. At the request of the Telecommunications Executive Committee, the AIHEC Board of Directors formally approved a motion that one of the three objectives for the second planning year (see Section X for the full motion) be to:

> "Provide consultant services to tribal colleges to assist in the development of a plan to provide local or regional distance learning networks or connection to existing local networks. Such plan will include equipment lists and projected costs for use by both the AIHEC Telecommunications Committee and the local college in the submission of grant applications."

With the decision made to use satellite communications for the backbone of the network, the three remaining components of networking can be addressed.

Program Reception

For each AIHEC college seriously to participate in any sustained television networking and program sharing efforts, a dedicated satellite downlink must reside on-site and an existing classroom must be outfitted to receive and employ such programming.

- ***Satellite Dish***

Each AIHEC college satellite receiving site should:

- Have the capability to receive satellite-delivered programming via either the C-Band or Ku-Band technical formats, in order to access the greatest number of programs available;

- Have the capability to receive programming via both the present analog format and the new digital compressed video format, again to maximize program availability;

- Have a dish sufficiently large to accommodate three factors:

    - the satellite's effective radiated power and coverage area (footprint) relative to the dish's location;

    - the expected rainfall conditions at that site;

    - the possibility of ground interference.

  Reception sites in the far north and far south are likely to require larger antennas.

- Have a motor drive and control system, for ease in steering the dish to receive programs on different satellites;

- Have standby power at those sites where electrical power dependency has proven to be troublesome;

- Be a turnkey installation, to ease problems of construction for the colleges;

- Be funded externally.

The specific reception equipment recommended is contained in Section IX: First Implementation Phase.

- ***Basic TV Reception Classroom***

A basic distance learning reception classroom will need to be equipped on campus for each college to participate in the AIHEC distance learning network. An existing classroom can be outfitted with the understanding that, when the TV classroom is not needed for a distance learning class or program over the satellite system, it can be used as a regular campus classroom.

The basic TV reception classroom should include:

- Television sets and stands;
- A videocassette recorder/player;
- Wiring from the satellite downlink to the classroom and to classroom telecommunications equipment;
- Telephone line installation and a telephone or speaker phone;
- A FAX machine;

- A personal computer, with computer software;
- A printer.

In addition to this equipment, the following support will be needed:

- A fulltime campus network coordinator;
- Operational training for this campus coordinator to assist campus faculty, staff and students to participate effectively in the distance learning programming.

The equipment listed above will make it possible for viewers at each AIHEC college to:

- Receive programming from various satellites;
- Participate in audio interactivity during programs;
- Participate in data interactivity during and after each program via computer, modem and fax machine; and,
- Participate in electronic data conferencing, electronic bulletin boards and discussion forums via the computer and modem.

The specific TV classroom reception equipment recommended is contained in Section X: First Implementation Phase.

Program Origination

Distance learning programs for AIHEC will be of two types: those originated by an AIHEC-member college or by several colleges working cooperatively, and those originated by non-Indian producers and used in some manner by colleges. This latter category includes both pre-recorded programs that are acquired and made available for AIHEC colleges use, and programs distributed via satellite by national educational satellite networks and received by individual AIHEC colleges using their campus reception equipment.

In any telecommunications distance learning network, program origination is far more difficult to undertake than program reception. Much more equipment is required, as are the time, effort and money to provide the staff to develop and produce the programming. In addition, programs originated at a member college must be sent to a satellite uplink for distribution to other colleges. Three levels of equipment for program origination are described below, from the least complex and least expensive to a full fledged and complex TV production studio.

- ***TV Program Origination***

Colleges that are able to justify early program origination, and do not currently have television origination cameras and other program production equipment, will want to study

three levels of or approaches to video origination:

- A Basic TV Originating Classroom that upgrades the TV Reception Classroom to enable video origination. Turnkey installation costs could total $30,000 to $35,000.

- An Advanced TV Originating Classroom that upgrades the basic TV classroom/studio above to provide more advanced equipment and capability. The costs could total from $55,000 to $65,000, in addition to the costs of the Basic TV Originating Classroom.

- A Video Teleconference Origination System that allows video communication in a convenient and operator-free manner, and requiring no production personnel. This self-contained unit could cost $70,000, including a $30,000 encoder for compressing the video signal for transmission via telephone cable or fiber (see below).

Appendix K contains descriptions of each program origination approach.

Each AIHEC college will need to determine what level of program origination it wishes to pursue, and a timeline for its implementation following the first implementation phase.

- ***TV Program Transmission***

In order to send courses or teleconferences from one AIHEC college to other colleges in the network, a set of sophisticated electronic satellite transmitting equipment is required. Colleges interested in serving as program originators will need to study two options.

Satellite Uplink: Model 1

The first option is costly, since it requires purchase and installation of a satellite uplink/origination dish. The equipment needed to uplink video and audio signals is changing rapidly with development of the newest compressed video technology. For each college installing a satellite uplink on campus, equipment such as the following would be needed:

1. Antenna, 4.5-5.0 meters in diameter;

2. 3-port Ku-Band feed system;

3. Motor drive and control system;

4. Antenna foundation;

5. Analog exciter system;

6. Digital modem system including encoder;

7. Ku-Band 300 watt transmitter system;

8. 2 Ku-Band low noise block converters (KLNB);

9. 2 Analog TV receivers;

10. 2 Integrated Receiver/Decoder (IRD's) for receiving digital compressed TV;

11. Waveguide between antenna and transmitter;

12. Control system for transmitter, antenna pointing frequency selection, analog/digital selection, etc.

13. Cabling from origination locations;

14. Provision of data transmission for sharing of data resources and printed materials.

In addition to this equipment, a college with an uplink would need to have several well-trained staff members capable of operating the equipment. These individuals would need to have a technical background and, preferably, experience in telecommunications. Installation of the equipment would be turnkey, but on-going maintenance would be required by technicians on-site.

The initial cost of an uplink that meets these specifications will likely run between $150,000 and $200,000. In addition, an uplink requires a significant amount of power. If deicing (mechanism to prevent ice from accumulating in the dish) is required, that would need to be figured into the operating expenses of the uplink.

There are clearly advantages for a college to have its own uplink: the availability of the uplink for use when the college wants it; the opportunity to train students in satellite technology; and possibly the chance to generate earned revenue from others in the area that might want to use the uplink. The disadvantages include: very high up-front costs; the need for trained technical staff; the need for extensive test equipment; the requirement for an FCC license to maintain and operate the uplink; and significant electrical power requirements.

The disadvantages explain why most distance education networks include very few uplinks of their own. It also explains why one-way video, via satellite, with interactivity via telephone, computer an;d FAX, are so prevalent.

With compressed video equipment improving and decreasing in cost, there is another alternative for producing colleges, however.

Satellite Uplink: Model 2

The second option calls for AIHEC colleges and the network simply to elect *not* to have an uplink on campus, because of both the cost of acquisition and the technical operation and maintenance required. Instead, these colleges can contract with a nearby satellite uplink and send the desired programming via telephone lines, optical fiber or microwave to the neighboring satellite uplink.

Preliminary research to locate uplinks within the states where there are AIHEC member colleges is contained in Interim Report #5. During the Second Planning year, other possible uplink stations that could be used will be identified, so that costs of this model can be estimated accurately.

There are two costs associated with this model: the first is the cost of transmitting the signal to the available uplink. A high quality, T1 telephone line, or optical fiber is the preferred technology for this link. Some campuses have microwave technology available, and this too could be used. The second cost is that of leasing the nearby uplink for the desired time needed. Uplinking rates range between $50 and $350 per hour. Designated telephone lines and optical fiber vary so much in cost that a case-by-case analysis will have to be conducted.

There are several advantages to this model, including avoiding the up-front capital expense of buying an uplink; avoiding the operational expense of technical staff, maintenance, and power; and the possibility of linking with intra-state fiber optic systems being built. The disadvantages include the potential lack of interconnection lines to existing uplinks; no available uplink; the inability to coordinate schedules with the uplink; the fact that the uplink may not be "looking at" the AIHEC satellite; and the lack of a digital modem at the uplink.

Each college will be assessing its needs, capability and level of interest as a program originator, and begin to explore local options for using existing uplinking equipment.

The question of purchasing a mobile uplink has been raised as a possible intermediate step in providing uplinking services to several colleges. Although this option has not been ruled out entirely for the future, it presents difficulties that would have to be addressed, specifically: Who will provide the technical staff needed to travel with the uplink to operate it? Would the mobile uplink be used for a full course and if so, how would the producing college staff provide the operational support? And, what uses would have priority? The experience of existing distance learning networks confirms that a mobile uplink not be recommended for the first implementation phase.

AIHEC Network Operations

All distance learning networks have centralized a number of functions for reasons of cost efficiency and effectiveness. AIHEC will examine these centralized functions carefully. They include a range of program-related services: coordination and scheduling of programming, advance service information, promotion and program storage and retrieval.

In addition to these program-related services, there must be a central operations center to oversee all of the technical requirements of the network. This center will require professional technical staff, duplicate equipment, in case of technical failure, as well as extensive electronic testing equipment and facilities to ensure that uplinks and downlinks are not causing interference and are at all times operating within Federal Communications Commission rules and regulations.

Most distance learning networks contract with an existing network uplinking and operations facility for these types of technical and operational services, rather than expend the significant capital required to build and staff a state-of-the-art facility. To establish a central operations center from scratch would be prohibitively expensive at the start of network implementation.

For at least the initial years, the AIHEC distance learning network should contract with a major educational satellite networking center to provide these vital technical networking operations. By so doing, AIHEC will be receiving dependable quality service in a much more cost-effective manner.

Summary of Technical Recommendations

- State-of-the-art satellite technology is recommended as the technical backbone of a network to meet the unique needs of the 27 geographically-dispersed AIHEC colleges.

- Each AIHEC college must have satellite reception equipment capable of receiving analog and digital transmissions via both C and Ku band satellites.

- Each AIHEC college must have a basic TV reception classroom with TV monitors, VCR, computer, fax, printer and telephone access. The distance learning classroom can be used for other courses when not in use for telecommunication courses.

- Not all colleges will originate programs and courses initially; those with existing production equipment will take the lead.

- Each AIHEC college intending to originate programming for the network will need to determine what level of production capability it prefers, in light of capital and operational expense and personnel required to operate the equipment. Three levels of production capability are presented for future consideration.

- For the immediate future, AIHEC colleges will not install and operate their own uplinks; rather uplinking services will be leased as needed from nearby uplinking facilities, accessed through T-1 or T-3 telephone lines, microwave or cable.

- For at least the initial year, AIHEC will contract with a major educational satellite networking center to provide technical networking operations, monitoring and support services.

VII. OPERATIONAL CONSIDERATIONS AND RECOMMENDATIONS

A number of operational and administrative considerations have already been addressed in the first planning year. These range from personnel-related issues to faculty training. The information as follows outlines recommendations coming out of the planning process, and suggests others that will need to be addressed in the course of implementing the network.

Staffing Considerations

The budget presented in Section IX: First Implementation Phase outlines the financial requirements for staff for the network during the first implementation phase. Listed here are the positions needed and the rationale for these positions.

Network Manager: As has been demonstrated throughout the planning phase, it is critical that a Native American with extensive experience in education lead the development of the network and serve as chief administrator and coordinator for all network programs and services. He/she will coordinate with AIHEC, NAPBC and the individual colleges and manage all day-to-day affairs of the network. All of the tribal colleges face unique problems and opportunities as they embrace the use of telecommunications. A Native American who understands these issues can assist each college in this process, balancing the needs of Native Americans with the requirements of potential funders.

Network Secretary: The project requires a full-time secretary/assistant, because of the extensive amount of collaboration and communications between and among the participation AIHEC colleges and advisory committees.

Network Program Coordinator: This individual will coordinate the academic as well as non-academic programming distributed via the network. This staff member will work with existing producers of distance learning programs to determine what will be useful to tribal colleges, and then take recommendations to the academic deans for selection. In addition, the program coordinator will work with each of the AIHEC colleges to ensure optimum use internally of these courses and programs. Further, the individual will work with teleconference producers, both within and outside of AIHEC, to ensure that colleges have access to the best programs possible. He/she will provide program announcements on a regular basis, containing sufficient information to enable each college to determine if the program might be of interest locally to students, faculty and other constituencies. The coordinator will work with those colleges ready and able to originate television programs for distribution over the network. The program coordinator will work most closely with the academic deans advisory committee and other program advisors to find or create the best possible programming for the AIHEC colleges.

Financial Issues

Discussions have begun on how colleges can be charged for students who enroll in courses offered by other AIHEC colleges, or other institutions. In addition, how will fees be assessed for other programming offered on the network. Although no definitive decisions have been made, the following represents some of the considerations that must influence final decisions:

- **Tuition and Fees**. This term will be used for what students pay their home institutions;

- **AIHEC Payment**. This term will be used for what colleges pay the network in order to enroll students in courses delivered by the network. The payment may be per student or may be a flat amount for a set number of students (this decision has not been made). It is assumed, however, that the amount of the payment will be a reflection of what the producing institution needs to recover in order to be able to provide the course over the network, and the amount needed to cover delivery costs. At least initially it is assumed that all credit courses on the network will have to be subsidized with outside funding. Before establishing the course fees, it is important to determine what AIHEC colleges pay now for adjunct faculty.

- **Student Count.** Each institution will count its own students for funding and reporting purposes, regardless of the fact that a particular course may be offered via the network by another institution. In other words, the course delivered via satellite would be considered the same way as a course delivered by an adjunct professor.

The academic deans expressed concern about the costs of the courses to the participating colleges and whether or not these costs would be comparable or less than the costs the colleges pay now for adjunct professors.

Several cost elements must be accounted for when developing a budget for distance learning programs and courses. Sample production budgets are provided in *Appendix G*, but these budgets do not detail the costs to the participating colleges. During the second planning year, described in Section X, the academic deans will work with the Project Team to identify the specific costs for each college participating in various types of programs and courses. These cost categories will include:

- **Costs to be covered by each college**

  Salaries
    Classroom facilitators for courses
    Facilitators for videoconferences
    Staff to oversee technical reception
    Campus network coordinator (costs covered by network for initial implementation year)

Support Resources

Textbooks for students
Supplemental materials for students
Space designated for courses/events
Publicity of courses/events
Registration for courses/events

AIHEC Payment

Probably a per student fee (rather than a per institution fee), paid to cover some portion of the costs of producing and delivering the course.

Videoconference Site Fee

Probably a single fee no matter how many viewers, paid to help off-set the costs of producing and delivering the videoconferences. A consortium fee will be negotiated that is a discount off the regular single site fee.

- **Costs to be covered by the AIHEC Network with outside funding**

Payment to Course Producers

A few colleges, such as Salish Kootenai, Bay Mills and Fond Du Lac, have experience in producing videoconferences and courses in their own or nearby studios. These colleges will be asked to help design standard, boiler-plate budgets that AIHEC will use to contract for courses from various AIHEC members, depending upon need and ability to produce. These budgets will include most of the budget categories found in the sample budgets in *Appendix G*. Funds to pay the course producers will come from two sources: AIHEC payments made by those institutions using the courses; and outside funders who have an interest in seeing that a specific course is provided.

Payment for Uplinking and Satellite Time

The AIHEC network will pay the costs of transmitting the signal from the studio to the closest available uplink, uplinking the signal to the satellite, and the satellite time. The interconnection to the uplink will vary from location to location; the cost of uplinking can range from $50 to $350 an hour; and satellite time can vary from $200 to $500 an hour, depending upon the satellite used and the time of day.

Payment for Telephone Interactivity

The AIHEC network will cover the costs of the 800 numbers used for courses and videoconferences, so that the individual colleges will not have to cover long distance telephone calls.

Payment for Coordination and Technical Oversight

The AIHEC network budget will include the expenses for program coordination and technical oversight activities (see administrative budget included in the first year implementation request, Section IX).

Colleges participating in the piloting of courses and videoconferences during the second planning year (see Section X) will not be charged any participation fee; these costs will all be covered by the PTFP grant and other outside funding.

From the beginning of the planning process, the assumption has been made that outside funding would be needed for the administrative support of the network as well as for the production and delivery of specific courses, so that the AIHEC payment and the videoconference fees can be kept as low as possible. The rule of thumb is that the fees cannot exceed those that AIHEC colleges pay now for adjunct professors and special events.

Registration Policies and Procedures

For live interactive satellite courses, the AIHEC Telecommunications Network will publish a list of courses that member colleges or others are willing to offer, complete with course description, outline, syllabus, teacher credentials, textbook information and required library resources. This information will also contain a schedule so that colleges know exactly what day and times the class will meet. With this information, each individual college will decide which courses fit within its educational mission and do not duplicate what is already available on-campus.

Colleges will elect to use whatever means they want to publicize a course. Courses could simply be described in the college catalogue, with a notation that they will be delivered via technology. The assignment of course numbers is up to each institution. There is not a consensus as yet on whether a receiving college can offer a course for a higher level of credit than the originating institution proposes.

The assumption is that students will enroll for satellite-delivered courses just as they enroll for any other courses. If a sufficient number of students do not enroll in the satellite-delivered course to make it worthwhile, the originating institution will have the option to withdraw the course. There is no decision as yet as to what constitutes an adequate number of students.

For pre-produced telecourses, registration policies and procedures are entirely up to the receiving institution. A schedule will be issued noting when the courses are going to be on the satellite. The institution can simply take the courses off the satellite and use them on campus as they so wish because there is no real-time interactivity involved. There will be a simple agreement form for each institution to fill out to indicate which courses are being used. PBS and the Annenberg/CPB Project are waiving the license and student fees for their telecourses for the pilot phase to encourage colleges to experiment with these courses.

About one-third of the AIHEC colleges are on the quarter system, and all colleges are particularly sensitive to the needs of their students to miss class for work or other legitimate reasons. Courses on the Network will need to start after October 1 as a rule, and conclude in April, if most of the colleges are to participate. In addition, some

flexibility and even repeat or tutoring sessions may need to be held throughout the academic term to assist students who have had to miss class.

Grading and Credit

For live, satellite-delivered courses, class assignments and tests will be provided by the originating college, and will be collected and graded by the TV teacher at the originating college. The TV teacher will keep distance education students abreast of their grades, much like a traditional class teacher.

It is assumed that each participating college will award credit for the courses based upon the recommendation of the TV instructor. In other words, the AIHEC distance learning network will not offer credit; each participating institution offers its own credit. If a student is not enrolled nor receiving transmission through an AIHEC college, the student will receive credit from the producing institution.

AIHEC colleges vary considerably in their policies about auditing a class. In general, auditing is encouraged and, in some cases, no AIHEC charge is made. It appears that as long as there are no extra demands on the TV teacher, students wishing to audit a network course can be allowed to do so.

For pre-produced telecourses, each college will assign a teacher for the course to meet with students as needed to help with their assignments, answer questions, and administer and grade tests. Examples of how to count this in terms of the load placed on faculty may be found in non-Indian colleges that have assigned faculty to telecourses.

Classroom Operation and Interactivity

Courses taught live will require students at each site to be able to call in to the TV teacher during the class period. In addition, material can be faxed and data can be sent via computer during and after class. The classroom equipment required for this level of interactivity is included in the first implementation phase package outlined in Section X.

AIHEC will follow the lead of other telecommunications networks by using 800 telephone numbers and audio bridge technology. At such time as AIHEC colleges hook up to Internet, Bitnet or other computer conferencing network, each student will be given an ID number and access to the classroom computer to interact with the TV teacher, as well as other students in the classroom.

A classroom instructor will be required at each receiving institution for each course for which students have enrolled. The classroom instructor for live interactive courses need not have any training in the course being offered, since all of the instruction will be delivered in interactive format by the TV teacher. The best qualifications for a classroom instructor is someone who would like to learn the information to be presented in the course. In this way, the classroom instructor becomes a co-learner with the students. The duties of the classroom instructor include:

- Administering the Course: Reading all of the materials about the course, and participating in a short training session via satellite held by the TV instructor before the course begins.

- Operating the Equipment: Making sure that the equipment is in place for each class session, setting up the recording equipment, if requested, and insuring that the room is arranged appropriately.

- Providing Liaison with TV Teacher: Helping the students become comfortable calling in during class and talking with the TV teacher during office-hours after class.

- Administering Exams and Quizzes: Serving as a proctor for exams; reporting concerns to the TV teacher; arranging make-up exams; and sending the exams and homework to the TV teacher.

- Participating in Evaluation: distributing and collecting evaluation forms, as requested.

Campus AIHEC Network Coordinator

One person at each college should be assigned to coordinate all AIHEC Telecommunications Network offerings on that campus. This individual will serve as the overall administrator for credit as well as non-credit programming. This coordinator will be the primary contact between the college and the AIHEC distance learning network central office for purpose of coordinating schedules, registering students, distributing mailings, and processing invoices. Specifically, this individual will:

- Serve as the Campus Coordinator for the Network: functioning as the primary information source concerning programs, schedules, fees, procedures, etc.

- Recruit Students: by completing and returning enrollment and registration forms for all courses and programs.

- Select and Assist Class Instructors: making sure that a faculty person is assigned for each course that the institution is offering from the Network.

- Participate in Evaluation: distributing and collecting evaluation forms, as requested.

Funding for this position is requested as part of the first phase implementation outlined in Section IX. A draft position description is provided in *Appendix K.*

Network Administrative Issues

The Network program coordinator will work with the academic deans to ensure the best possible selection of courses and programs for use on the college campuses. This will involve working with individual colleges to help develop credit and supplementary courses as well as relating to third party producers who may have courses of interest to some of the AIHEC colleges.

A procedure will be developed in association with the deans to select courses and programs for the network, ensuring that such decisions are made in a timely and fair manner, reflecting the needs of the colleges. The program coordinator will negotiate the best possible financial arrangement with third party producers and will work with the network manager and others in marketing the network and securing outside funding to support the development of additional courses and programs.

The program coordinator will also assume responsibility for ensuring that print materials are distributed in a timely manner for courses and for teleconferences. It is anticipated that almost all programs (credit courses as well as video teleconferences) delivered via the network will have some type of print associated with them. In some cases, the print material will be sent to participating sites directly from the producers; in other cases, there will be a central mailing function. In both cases, oversight will be exercised by the program coordinator.

Course and Videoconference Productions

Questions have been posed throughout the planning year concerning where courses will actually be produced. As is evident from the facilities profiles of each campus,and the results of the academic deans meeting, several AIHEC colleges have experience and interest in producing video-based instruction-credit courses as well as videoconferences of a variety of types. The academic deans will work with the network's program coordinator to identify specific courses that are needed and determine which institution(s) is best able and qualified to produce them.

Although initially the network offices will be located in Lincoln, the Nebraska studio and uplinking facility will likely only be used if Haskell Indian Junior College or the Nebraska Indian Community College (both of which are nearby) want to use it to deliver programming for the network, or if administrative videoconferences are needed for the campus network coordinators. Otherwise, the programs and courses will originate from various AIHEC colleges using existing or borrowed studio facilities.

Faculty Training

The faculty and others teaching over the network will receive special training to ensure greatest possible ease with the technology. This training will take place in several ways, including face-to-face at conferences and special events, as well as via the technology itself. Several AIHEC-member colleges have experience with teaching faculty to use the media; they will be called upon to help train others, as needed.

In addition to presenters, the classroom instructors (described above) will need to be trained. Specific training for each course will be provided before the semester begins, so that each person is well acquainted with what is expected during the course. It will be during this training that the TV instructor and classroom instructors will discuss what library materials may be needed to augment campus library resources.

The network will provide training periodically for those individuals serving as facilitators of video teleconferences. This training will be accomplished via the network, and will be offered several times a year to encourage several faculty and staff on each campus to serve in the important role of facilitating teleconferences on a variety of subjects.

Network Operations

AIHEC will contract for satellite coordination services to be provided to the network. By contracting for services, AIHEC will not have to hire yet another network staff member for what, at least initially, will be only a half-time need. Operations coordination services will include the following:

- Assisting the program originator in finding and contracting with an uplinking facility that is available and reachable through fiber optics or telephone lines. A standard uplinking agreement will be developed with a list of acceptable prices from which to negotiate fees;

- Selecting and booking satellite time. To the extent possible, AIHEC will want to use the same satellite for most of its transmissions to reduce confusion and mistakes. However, if an uplink is "looking at" another satellite, then the downlinks may need to be steered to the different satellite. (All of the receive dishes will be steerable, capable of receiving both C and Ku-band signals.)

- Preparing a monthly schedule of satellite feeds, including times of AIHEC-produced programming as well as third-party programming of interest to AIHEC members, to be used by the program coordinator;

- Arranging for the taping of programs;

- Providing technical trouble-shooting, for uplinking and receive sites;

- Overseeing the maintenance contract obtained on all of the equipment installed on each of the campuses to ensure that equipment is repaired or replaced in a timely manner.

Summary of Operational Recommendations

- Three staff members are needed for the initial implementation year, to be housed at the Native American Public Broadcasting Consortium in Lincoln, Nebraska: a Native American Network Manager; a Native American Program Coordinator; and a project secretary.

- The student count for AIHEC-delivered courses will remain with the student's own institution, as though the network was an adjunct professor.

- Courses on the network will start after October 1 as a rule and conclude in April so that most colleges can participate whether or not they are on the semester or quarter system.

- For pre-produced telecourses, each college will assign a teacher for the course to meet with students as needed to help with assignments and oversee the class; for live, interactive courses, the TV teacher will serve as the content-specialist so the classroom facilitator will not be expected to have any knowledge of the subject matter.

- Colleges participating in the piloting of courses and videoconferencing during the second planning year will not be charged any participation fee.

- Outside funding will be secured for the administrative support of the network as well as for the production and delivery of specific courses so that the AIHEC payment, and the videoconference fees, paid by participating colleges can be kept comparable with what colleges pay now for on-campus and adjunct professors.

- A Campus AIHEC Network Coordinator will need to be appointed on each campus to organize and coordinate all of the programs and services offered by the network-for students, faculty, staff and off-campus populations. (Funding for this position is included in the funding request for the first implementation phase.)

- Faculty and others teaching over the network will need to receive special training, as will classroom facilitators, to ensure the creative use of the technology for effective learning.

VIII. GOVERNANCE AND ORGANIZATIONAL CONSIDERATIONS AND RECOMMENDATIONS

In keeping with the recommendation that implementation of an AIHEC Telecommunications network be completed in phases, the organization, governance and staffing of such a network will need to be developed correspondingly. The proposals and recommendations contained in this section of the report relate specifically to the *initial* implementation phase of the proposed distance learning network.

AIHEC Telecommunications System Governance

The governance structure of the AIHEC distance learning network must accommodate five objectives during its initial implementation phase:

- Ensure that the needs and interests of AIHEC-colleges are served;
- Provide appropriate coordination between the Telecommunications Network and other AIHEC-sponsored initiatives, as appropriate;
- Provide leadership from the AIHEC Board of Directors, as formal policies and procedures are presented and adopted for network operations;
- Ensure the fiscal soundness of all financial planning, capital expenditures and operational expenditures;
- Establish policies governing the generation of outside funding for implementing succeeding phases of network development.

It is recommended that the governance structure currently in place for Telecommunications Planning Project Year One and Year Two be maintained at least through the implementation phase. This structure served the planning project well. The structure has been employed by AIHEC to implement other consortial projects, and thus has the confidence of the AIHEC Board of Directors as an effective strategy to ensure proper oversight. Specifically:

- ***Legal authority*** and responsibility for the AIHEC distance learning network will continue to reside with the American Indian Higher Education Consortium Board of Directors;
- ***Oversight*** authority will continue to be delegated to the AIHEC Telecommunications Executive Committee, as a Standing Committee of the Board.

The Telecommunications Executive Committee will continue to undertake a critical role in overseeing all network development. So, for example, the Committee will approve funding proposals and participate in long range planning activities for the network. Committee members will be authorized for selection of staff for the network. And, they will review quarterly financial reports provided by the fiduciary organization, on behalf of the AIHEC Board. In other words, the Telecommunications Executive Committee will perform all of the duties that would normally be assigned to a Board of Directors, were the network separately incorporated.

AIHEC Network Organization Structure

The AIHEC Telecommunications Network's organizational structure must accommodate at least seven objectives during the initial implementation phase:

- Maintain the guiding philosophy of the Project;
- Continue to employ Native Americans in the operation of the Network;
- Provide appropriate continuity from AIHEC Telecommunications Project planning to network implementation, maintaining the momentum and interest already generated;
- Minimize expenditures by taking advantage of infra-structures and resources already in place;
- Maintain control of the network on behalf of AIHEC-member colleges;
- Continue the level of managerial and technical professionalism established during the planning process; and,
- Ensure that decisions are made in a timely manner, to take fullest advantage of opportunities that arise unexpectedly.

It is recommended that an organizational structure similar to that in place for the Year One and Year Two planning phases be maintained for the implementation phase, as well. Often an organizational structure is dependent upon the personalities and qualifications of the individuals involved, if it is to work effectively. In this case, the structure itself allows considerable flexibility in the use of resources from the colleges of the Consortium, as well as the use of consultants, to meet the needs of the Project, as they become apparent. The structure is highly inclusive, involving all of the AIHEC colleges in the decision-making process. This should continue.

Specifically, the following is recommended:

- ***Fiduciary Organization***. Northwest Indian College will continue to serve as the fiduciary agent for all network activities, on behalf of AIHEC. It is important that the funding for network capitalization and operations be administered by one of the members of AIHEC. Further, all funding sources will require that the fiduciary organization be incorporated and show evidence of its ability to administer and be accountable for the considerable funding required to implement and operate the network. NWIC has performed in exemplary manner during the planning phase of the Project, demonstrating both the ability and commitment to ensure that the Project succeeds. Northwest Indian College should be requested to continue to serve as the responsible fiduciary agent for the AIHEC distance learning network, on behalf of all participating colleges.

- ***AIHEC/NAPBC/NET***. AIHEC will contract with the Native American Public Broadcasting Corporation and Nebraska Educational Telecommunications through a three-way memorandum of agreement, annually renewable, to provide management services and house the AIHEC distance learning network headquarters and AIHEC satellite operations center. (The successful

NET/AG*SAT arrangement offers an appropriate model.)

The arrangement will:

- Empower continued Native American control;
- Empower AIHEC to operate with a much smaller network headquarters staff than would otherwise be possible;
- Provide the network staff with NAPBC backup support, as well as office space and office support;
- Provide network staff an excellent employee benefits package at a reasonable cost from NAPBC;
- Take advantage of NAPBC's educational telecommunications experience, consistent with NAPBC's mission;
- Provide access to NET's $1,050,000 state-of-the-art complete satellite center, including expensive test equipment to ensure technical quality control, interference--free signal delivery, and complete backup/redundancy equipment;
- Eliminate the necessity at the outset to construct a separate network satellite uplink and control center and see it staffed accordingly, until future need supports such a facility;
- Make available through NAPBC/NET a fully trained professional technical staff available to coordinate the uplinking from various origination points and widespread distribution of AIHEC programs;
- Enable the AIHEC Network to begin operations and program service sooner than any other manner;
- Through NAPBC, provide access to the continued consulting services of the NET technical center and its general manager, since the same relationship exists between NAPBC and NET;
- Allow the AIHEC Network to take advantage of NAPBC/NET's bulk purchase of satellite transponder time, thereby allowing AIHEC to enjoy satellite transmission at lower rates;
- Allow the AIHEC Network to schedule small amounts of satellite time and increase the time, as needs dictate and resources permit, rather than committing to a bulk purchase at the outset of each year and hoping that it can fill the time;
- Save considerable expense, since uplinking, satellite leasing, control and test costs available through NET are among the lowest of any such installation in the United States;
- Reduce overhead/administrative services charges, by working through NAPBC rather than directly with NET;
- Build on the experience and reputation of NAPBC and NET in securing additional AIHEC funding for the growth of the Network;
- Eliminate the need for new AIHEC Federal Communications Commission licenses; and
- Facilitate the possibility of joining for mutual advantages with the American Indian Radio Satellite (AIROS) project, with the Indigenous Communications Association (ICA) and with NAPBC.

- ***AIHEC Network Manager***. An experienced Native American will be sought to head the AIHEC Network, its daily operations and services. Recruiting will be undertaken jointly by NAPBC and the AIHEC Telecommunications Executive Committee. The Network Manager will report directly to the Chairman of the AIHEC Telecommunications Executive Committee.

- ***AIHEC Distance Learning Network Office:*** The network offices will physically be located at NAPBC in the Nebraska Educational Telecommunications Center, where the AIHEC Network Satellite Operations Center will also be established. Since the three-party AIHEC/NAPBC/NET arrangement would be in force on a twelve month basis, with renewal options, AIHEC at any time in the future can move the AIHEC Network office and operations center to any one of the tribal college campuses or any other uplinking location, should it want to do so.

- ***Advisors and Consultants***: The Department of Commerce/PTFP and the Public Broadcasting Service (PBS) will be asked to continue in their role of advisors to the Project. These organizations have extensive experience and contacts in distance education and educational telecommunications, all of which will be most valuable in both building a network and seeing it supported in the years ahead.

  To the extent possible, Native Americans will be asked to serve as consultants to the Network, especially those representatives of AIHEC colleges who are gaining experience in distance education, program production and network operations. External consultants would be available to provide specific counsel, as appropriate.

- ***Advisory Committees:*** Because of their roles and responsibilities, AIHEC academic deans will continue to play a central role in developing the AIHEC network and its program services. Each college dean should be formally designated as that college's representative to the Network. The deans will elect from their numbers a seven-member Academic Council to work regularly with network staff to select and schedule programming and to plan future programming.

  A seven-person Telecommunications Network Operations Committee will also be permanently established, to assist network headquarters in establishment of operational procedures and technical service.

- ***Contracts:*** A formal fiduciary arrangement will be established between AIHEC and NWIC. Similarly, the tripartite AIHEC, NAPBC and NET memorandum of agreement should be negotiated and executed.

  In addition, contracts or letters of understanding will be created for the producers of courses as well as teleconference. These are usually quite standard and will not require outside legal counsel.

- ***Applications*:** At such times as the Network applies for funding from the Department of Commerce/PTFP program for facilities funding, or to another federal agency or national funder for major program development grants, the help of communications attorneys familiar with these requirements may be needed.

- ***Federal Communications Commission Licenses:*** FCC licenses to install satellite downlinks are not required; they are for uplinks. Licenses are also required for microwave and low power television transmitters. Any such college applications for electronic transmissions that require licensing will require both FCC applications and legal counsel.

- ***Copyright Issues:*** All programs created by AIHEC colleges need to be copyrighted, so a user-friendly, low-cost means of copyrighting video and print materials will be developed. Further, program producers will need to be especially sensitive to the use of copyrighted material being transmitted over the air. A routine and timely review process should be established to ensure that errors are not inadvertently made. Also, regulations governing intellectual property rights will need to be studied and procedures developed.

Future Considerations:

Once the network is activated and operational, AIHEC and its member colleges may want to revisit several governance and organizational matters:

- ***Organizational Structure***: As network development proceeds, the initial organizational structure will need to be revisited and refined. Relationships with NAPBC and NET will need to be scrutinized and evaluated in comparison with other opportunities, new developments and different organizational arrangements.

- ***Other Legal Considerations***: Various legal matters, such as liability, will have to be addressed, once funding for network implementation has been secured;

- ***Network Office Location:*** Because of the nature of the proposed AIHEC distance learning network, it will always remain highly decentralized. So, for all practical purposes, the network offices will largely remain administrative in nature. AIHEC may wish to move the administrative offices at some point in the future, if there is good reason so to do. The network will be saving considerable money at the outset and for the immediate future by working with and through NAPBC. Again, the matter can be readdressed any time in the future.

Summary of Governance and Organizational Recommendations

- The organization and governance structure of the AIHEC Telecommunications Network during at least the first implementation phase will duplicate the structure used to govern the telecommunications planning project, with the Telecommunications Executive Committee of the AIHEC Board continuing to provide Board oversight of the initiative.

- Northwest Indian College will be asked to continue to serve as the fiduciary agency during the implementation phase of the network.

- The AIHEC network offices will be located at the Native American Public Broadcasting Consortium in Lincoln, Nebraska, at least for another year, until a specific plan is developed for the continued development and management of the network, as outlined in the second planning work assignments.

- AIHEC will contract with the Native American Public Broadcasting Corporation (NAPBC) and Nebraska Educational Telecommunications through a three-way memorandum of agreement, annually renewable, to provide management services and house the AIHEC network headquarters and satellite operations center.

- Each AIHEC academic dean should be formally designated as the college representative of their respective colleges; they will elect a seven-member Academic Council to work with network staff.

- A seven-person Telecommunications Network Operations Committee will be permanently established to work with network staff.

IX. RECOMMENDATIONS FOR FUNDING FIRST IMPLEMENTATION PHASE

The Telecommunications Executive Committee and its Planning Project Team considered at length various technical approaches to constructing an AIHEC distance learning network, keeping in mind both financial resources, the need for phased development, and the need for equity between AIHEC college members.

The following initial implementation phase is recommended. It should be considered the first of a series of building blocks that logically and systematically will in the future empower Native American tribal and BIA-operated colleges to expand their telecommunications program origination, program reception, interconnection and interactive capability, as both needs dictate, experience is generated, and resources are made available.

First Implementation Phase

It is recommended that:

1. Each AIHEC member college receive a main AIHEC distance learning network receive dish (downlink);

2. Each college receive an equipment package to outfit an existing classroom as a basic TV reception classroom;

3. Each college receive first year funding for a fulltime campus network coordinator;

4. Special training for the 27 campus network coordinators be provided; and

5. Support be provided for the AIHEC distance learning network headquarters and staff, operations and initial program services.

The following elaborates upon and provides specific information about each of these recommendations. Descriptions and costs for each recommendation are provided. This section then summarizes the capabilities and service benefits made available as the result of this initial implementation phase.

- **Main Network Downlink at Each College**

A number of factors had to be considered in determining the specific equipment to be recommended for each AIHEC college main reception site, including:

- Different satellite transmission coverage areas (footprints);
- Size of the dish, depending upon location relationship to the satellite footprint, rainfall and other considerations;
- Ability to receive programming from each of two different satellite technical

transmissions formats, C-Band and Ku-Band, in order to maximize program service availability;
- Steerability, for ease of operation and ability to address different satellites;
- Necessity for deicing equipment, depending upon location and winter weather;
- Ability to receive both analog and digital transmissions, and accommodate the newest compressed video technologies;
- The need for auxiliary or standby power; and
- The need for turnkey installation.

Following are recommendations for each of the 27 AIHEC member college sites:

The following sixteen sites should use a higher gain antenna (4.5 meter) to assure adequate performance on all satellites as the result of a satellite's radiated power and, therefore, ground coverage.

Bay Mills Community College, Brimley, Michigan
Blackfeet Community College, Browning, Montana
Dull Knife Memorial College, Lame Deer, Montana
Fond Du Lac Community College, Cloquet, Minnesota
Fort Belknap Community College, Harlem, Montana
Fort Berthold Community College, New Town, North Dakota
Fort Peck Community College, Poplar, Montana
Lac Courte Orielles Ojibwa Community College, Hayward, Wisconsin
Little Big Horn Community College, Crow Agency, Montana
Little Hoop Community College, Fort Totten, North Dakota
Northwest Indian College, Bellingham, Washington
Salish Kootenai College, Pablo, Montana
Standing Rock College, Fort Yates, North Dakota
Stone Child Community College, Belcourt, North Dakota
Turtle Mountain Community College, Belcourt, North Dakota
United Tribes Technical Council, Bismarck, North Dakota

The following two sites should use a higher gain antenna (4.5 meter) to assure adequate performance due to Ku-Band rain fade:

Haskell Indian Junior College, Lawrence, Kansas
AIHEC's Washington, D.C. Office

A downlink is recommended for AIHEC's Washington, D.C. office, to allow personnel at this site to monitor AIHEC distance learning network programming, and ultimately to be able to employ the network for teleconferences with the AIHEC Board of Directors and other administrators at the 27 colleges. By so doing, a considerable amount of both the presidents' time and travel budget can be saved.

The eighteen college sites recommended for the high gain receive systems will use the following equipment complement:

1. 4.5 Meter antenna with motorized polar steering, with two-port C-/Ku-feed.

2. C-Band LNB, 45 degree K or better, 1 Mhz frequency stability for SCPC digital video reception.

3. Ku Band LNB, 0.9 Db noise or better, 1 Mhz frequency stability for SCPC digital video reception.

4. Integrated Receiver Demodulator, L Band input for reception of analog full and half transponder video and for reception of Digicipher digital video at A, B, or C data rates encoded either SCPC or TDM. If IRD does not include steering control for the antenna, a suitable controller shall be provided.

5. Interfacility linking, turnkey installation (assuming ground mounting), testing and operational training.

The following ten tribal colleges will be able to use a standard gain antenna system:

Cheyenne River Community College, Eagle Butte, South Dakota
Crownpoint Institute of Technology, Crownpoint, New Mexico
D-Q University, Davis, California
Institute of American Indian Arts, Sante Fe, New Mexico
Nebraska Indian Community College, Niobrara, Nebraska
Oglala Lakota College, Kyle, South Dakota
Sinte Gleski University, Rosebud, South Dakota
Sisseton Wahpeton Community College, Sisseton, South Dakota
Southwest Indian Polytechnic Institute, Albuquerque, New Mexico
Navajo Community College, Window Rock, Arizona (Initial study indicates standby-power will be required for this site only.)

The ten college sites recommended for the standard gain receive systems would use the following equipment package:

1. 3.7 Meter antenna with motorized polar steering, with two-port C-/Ku-feed.

2. C-Band LNB, 45 degree K or better, 1 Mhz frequency stability for SCPC digital video reception.

3. Ku Band LNB, 0.9 Db noise or better, 1 Mhz frequency stability for SCPC digital video reception.

4. Integrated Receiver Demodulator, L Band input for reception of analog full and half transponder video and for reception of Digicipher digital video at A, B, or C data rates encoded either SCPC or TDM. If IRD does not include steering control for the antenna, a suitable controller shall be provided.

5. Interfacility link, turnkey installation (assuming ground mounting), testing and operational training.

All 28 systems will, therefore, be able easily to access a wide selection of programming distributed from existing domestic communication satellites.

The average cost for each equipment package and turnkey installation is $12,000, including a one-year maintenance contract. The total cost for 28 downlinks is $336,000.

- **Basic Distance Learning TV Reception-Only Classroom Equipment Package.**

A classroom will need to be adapted on campus for each college participating in the AIHEC distance learning network. The Project assumes that an existing classroom will be outfitted with the understanding that, when the TV classroom is not needed for a class or program being transmitted over the satellite system, the facility can be used as a regular campus classroom.

For purposes of planning, it is assumed that the distance learning classroom at each college will hold about 25 viewers. Although most of the credit courses delivered over the network will likely have less than 10 students at any given institution (in many cases less than five), the larger size is preferable so it can serve a larger tribal audience for non-credit educational and informational programming delivered over the network.

Each AIHEC college should receive the following basic distance learning reception classroom equipment package:

- Two television sets and stands
  Television receiver/monitor, color, 26-27",
  cable-ready,
  450 lines horizontal resolution
  Rolling television stand, 54",
  5" wheels, horizontal top

- One videocassette recorder/player
  VCR, VHS, two-speed record, three-speed playback, cable-ready,
  real-time read out,
  250 lines horizontal resolution, S/N 45 dB

- Coaxial cabling
  Cable from satellite dish to the classroom building, extended to TV classroom, including wiring sets, VCR, etc.

- Telephone line installation

  A telephone jack with switch in the distance learning classroom capable of handling an audio line, the computer modem and a FAX machine

- Telephone instrument

  Audio equipment that will allow students to talk to their TV teachers during the class, such as used by SERC. If more than 5 students need to use the telephone for response, a small conferencing unit is recommended, with touch-to-talk microphones.

- FAX machine

  A laser jet fax that can be used to make photocopies during and after class for assignments and for camera-ready handouts for teleconferences.

- Laser Printer

  A laser jet printer to provide camera-ready quality handouts for courses and for teleconferences.

- One personal computer with applicable modem

  A 486/33 or faster personal computer with at least 120 MB HD, 1.2 FD, 1.44 FD, 8 MB RAM, .28 SVGA monitor, a mouse, 9600 internal fax/modem, with 5.0 DOS and Windows 3.1.

- Computer software

  Word processing package (e.g., WordPerfect for Windows)
  Data communications package (e.g. Procomm)
  Spreadsheet (e.g., Excel)
  Database (e.g., Alpha 4)
  Presentation graphics (e.g., Harvard Graphics)
  Paint/draw graphics (e.g., Adobe Illustrator)

- CD ROM Player

  A CD Rom player for access to a range of library resources needed for the telecourses delivered on the Network.

- Membership in On-line Services

  Access to nationwide on-line services for educational resources (e.g., Internet, Prodigy, CompuServe, America, On-Line, ENAN, NATIVE NET).

The total costs for the basic distance learning TV reception-only classroom equipment package; with turnkey installation will be $15,000 per college. As described in Section VI, the reception classroom can at any later time also become a TV origination classroom, with the addition of cameras and other equipment.

Several AIHEC colleges already have equipped a campus classroom for distance learning video reception. These colleges will have the option either to outfit a TV reception classroom on a second campus, locate the equipment on the reservation for tribal community reception, as appropriate, or to use the college's first implementation phase fiscal allocation otherwise to improve the college's ability to participate fully in the AIHEC distance learning network.

- **Network Campus Coordinator**

The experience of the other national distance learning satellite networks clearly indicates that a representative of each participating college must be designated to coordinate all college program activities with AIHEC network headquarters, and to coordinate program service usage appropriate to the college and its on-and off-campus constituencies.

Appendix K contains a draft position description for the campus network coordinator, describing duties and responsibilities in greater detail.

In view of the severity of Native American colleges' current fiscal problems, external funding to support these new college positions must be provided. An average salary of $30,000 per year per college is recommended. With benefits, the total cost per college then is averaged at $36,900.

- **Campus Network Coordinator Training**

Because the network campus coordinators are so important to the success of the distance learning network, they must receive hands-on training. A custom-designed two and one-half day training session is recommended. All 27 campus coordinators should be brought to NAPBC/AIHEC network headquarters, where multiple TV reception classrooms are located and trainees can gain valuable experience in all aspects of distance learning reception, origination, networking, and course and program coordination and usage. Bringing the group to Lincoln also gives the trainees firsthand knowledge of all technical aspects of the AIHEC networking coordination center. The training experience can be provided at modest cost at this location.

Costs involved are as follows:

27 campus coordinators travel, lodging, and meals @ $1,000	$ 27,000
Hands-on training program expenses	1,000
Total	$ 28,000

- **Operational Costs**

According to the proposed three-party AIHEC/NAPBC/NET agreement, NAPBC will each year develop for AIHEC Board approval a proposed operating budget. The implementation year operating budget is recommended, as follows:

Staff: The three initial network staff members should be Native Americans. NAPBC will develop position descriptions for each of the three, to be approved by the Telecommunications Executive Committee, and will conduct national searches, with the Executive Committee approving recommended selections.

AIHEC Network Manager:	Salary	$ 45,000
Network Program Coordinator:	Salary	30,000
Network Secretary/Assistant:	Salary	15,000
Benefits		21,600
		$111,600

Operations:

Communications: Telephone, FAX, Computer	$ 7,000
Supplies & Consummables: Office, Duplication, Shipping, etc.	11,000
Printing and Publications Services	10,000
Accounting and Business Services	14,000
Operational Services	12,000
Consultant Services: Technical and Planning	20,000
Legal Services	10,000
Travel and Meetings	20,000
Programming and Video: Course Support Teleconference Support Development	40,000
Satellite: Transponder Lease Uplinking	50,000
Network Development	10,000
NAPBC Administrative Fee @ 5%	10,600
NWIC Fiduciary Fee @ 3%	6,400
	$221,000

- **First Implementation Year Financial Summary**

Initial Capital Equipment Costs

28 Downlinks @ $12,000	$336,000
27 Distance Education Classroom Packages @ $15,000	405,000
	$ 741,000

First Year Operational Costs

27 Campus Coordinators @ $36,900 incl. benefits	996,300
Training for 27 Coordinators	28,000
Staffing	111,600
Operations	221,000
	$1,356,900

First Implementation Year Total	**$2,097,900**

- **First Implementation Phase Capability**

Activation of this first AIHEC distance learning network implementation phase makes the following possible:

- Provides the foundation--the first building block--upon which additional origination, reception, interconnection and interactivity can take place in logical and systematic manner, as needs warrant and additional financial support becomes available;
- Activates the AIHEC distance learning network headquarters and staff;
- Gives each college the ability to receive satellite-delivered programming originated from AIHEC or any other satellite program services available on various satellites;
- Allows each campus to select, receive and use satellite-delivered programming according to the colleges' own individual needs;
- Enables interactive participation between students and presenters via telephone, FAX and/or computer;
- Treats each college equitably.
- Provides a dedicated individual on campus to assist with the college's use of programming and future telecommunications development;
- Provides a foundation and base upon which future phases can be added, including decisions on the use of fiber optics, telephone lines, compressed video, etc.;
- Provides a network facility for AIHEC to use for administrative purposes, i.e., AIHEC Board meetings, Telecommunications Executive Committee meetings, meetings of deans, librarians, etc.
- Serves as a catalyst to solicit additional funding leverage for second and third phased development and program development support;

AIHEC could accommodate starting first phase implementation in the summer of 1993, should funding become available. Activation could thereby take place in parallel with second year planning which, as the following report section indicates, is to begin April 15, 1993. Second year planning will then provide specific information concerning in-state program distribution for the AIHEC colleges, and will generate the information necessary to develop a specific AIHEC distance learning network Year Two operational budget.

Summary of Recommendations for First Implementation Phase

- The following equipment and operational support is recommended for the first of a series of building blocks that will lead systematically to a comprehensive telecommunications network serving multiple sites on AIHEC college campuses, as well as other receive sites to reach all of Indian Country;

  1. A main campus satellite receive dish for each AIHEC campus plus the Washington, D.C. office.

  2. An equipment package to outfit an existing classroom as a distance learning TV reception classroom, with TV monitor, VCR, computer, printer, modem, FAX and telephone equipment.

  3. First year funding for a full-time Campus AIHEC Network Coordinator.

  4. Special training for the 27 Campus AIHEC Network Coordinator.

  5. First year funding for network operations and initial program services.

- A total of $2.1 million is needed to activate the implementation phase for the network.

- Activation of the network could take place in parallel with second year planning, beginning in the summer of 1993, should funding become available.

X. SECOND YEAR PLANNING

To enable planning for AIHEC to continue without interruption, Congress appropriated additional funding, as follows.

FY 1993

From Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, 1993, Pub.L. 102-395 (Oct. 6, 1992), 106 Stat. 1854:

> "Provided further, That $250,000 shall be available for the American Indian Higher Educational Consortium for utilization of telecommunications technologies."

From the Report of the U.S. Senate Committee on Appropriations, pertinent to the above-cited appropriations bill, July 23, 1992:

> "The Committee has included $250,000 to enable the American Indian Higher Education Consortium to continue, in consultation with the National Telecommunications and Information Administration and the Public Broadcasting Service, the development of its plans to employ telecommunications technology to accomplish the missions of tribally controlled community colleges and other members of the consortium. Planning activities may include identification of other prospective users of proposed systems and prospective requirements, education and training of key staff, and the conduct of demonstrations that contribute to the development of plans and recommendations."

AIHEC, therefore, has requested an amendment to its FY 1992 Department of Commerce cooperative agreement to address a specific second year work plan, to being April 15, 1992.
The recommended work plan was developed in direct response to the following AIHEC Board of Directors' motion, formally approved at a November 15, 1992 meeting:

> "It is moved that AIHEC Telecommunications Executive Committee be authorized to develop, submit and negotiate with NTIA a specific budget for the second year of the AIHEC Telecommunications Planning Project, beginning on April 15, 1993 and running through April 14, 1994, to implement the following three objectives.
>
> 1. Provide consultant services to tribal college to assist in the development of a plan to provide local or regional distance learning networks or connection to existing local networks. Such plans will include equipment lists and projected costs for use by both AIHEC Telecommunications Committee and the local college in the submission of grant applications.
>
> 2. Pilot test an AIHEC Satellite Delivery System, by providing up to two courses per quarter, beginning in Spring of 1993 and running through Winter, 1994. Pilot test will involve all interested TCC's with existing downlinks, with actual courses to be selected following completion of the programmatic needs survey and provision of staff training for those TCC's participating in the pilot test.

3. Arrange for a minimum of two teleconferences designed as in-service training for two Indian agencies other than tribal colleges.

In fulfilling these objectives, the project staff will demonstrate the viability of using multiple uplinks as opposed to relying upon one centralized uplink."

The objectives of the Year Two work plan, as finalized by the Telecommunications Executive Committee, are:

Objective 1: To develop a customized long term plan to suggest improvements to each AIHEC college's local educational telecommunications needs, and to extend AIHEC distance learning network programming from each AIHEC college's *main* campus reception point to other campuses and community reception points of the same college, as well as to interconnect with in-state telecommunications systems;

Objective 2: To generate actual academic and operational experience through pilot delivery and use of at least two telecourses in each of two successive terms;

Objective 3: To gain additional experience through delivery and employment of at least three satellite teleconferences presented in cooperation with one or more Native American service agencies;

Objective 4: To develop informational materials describing the new AIHEC distance learning network and seek external capital and operational funding to see the network become a reality; and

Objective 5: To develop a specific plan for the continued development and management of the AIHEC Telecommunications Network, including permanent and interim (if necessary) location of centralized administrative offices with uplink and production facilities appropriate to support the national network.

Guiding Philosophy

The academic deans at AIHEC colleges have recommended the following guiding philosophy for the planning process, as the way to maintain the traditional values and philosophy of Native Americans. This philosophy will guide the Telecommunications Committee, project staff and campus coordinators, as the planning process continues:

"The AIHEC Telecommunications Network must work to preserve the traditional values and philosophy of Native Americans. The Network must seek the guidance of traditional elders. In order to implement this guiding philosophy, the planning process will promote the following activities:

1. Share the Project plan and its potential with tribal elders, council chairs, medicine men and women, and religious leaders, both to develop awareness and
   secure their counsel and support;
2. Arrange a special satellite teleconference or teleconferences to these groups, presenting and explaining the Project and the networking system to viewing groups on campuses where downlinks are available, and encouraging other AIHEC colleges to assemble viewing groups at nearby downlinks;
3. After the video presentations, including question and answer time on the program, viewing groups will discuss the project, and the campus coordinators will forward written summaries of these discussions to the planning project staff for inclusion in future planning reports and activities."

Work assignments and procedures for each of the objectives are described, as follows:

Objective 1:

The Year 1 AIHEC Telecommunications Planning Project will conclude on April 14, 1993, with specific recommendations regarding an interconnected telecommunications network. The first activation phase provides reception capability for all participating colleges, as well as limited origination capability for certain colleges. The initial plan concentrates on providing satellite services to a main campus location. But, many Native American colleges have several campuses often separated by some distance. In addition, colleges want to reach several additional off-site reception points in order to provide network programming for their tribal constituencies. Further, AIHEC colleges appropriately want to interconnect with neighboring non-Indian colleges and universities, in order to exchange instruction, as well as to be interconnected with in-state telecommunications networks being planned and developed.

Each college has a somewhat different situation. Certain colleges have facilities and partial interconnection in place; others have none. A customized plan, therefore, needs to be developed for each institution.

AIHEC plans to obtain the services of either a fulltime communications engineer or several parttime engineers to develop local campus reception, origination improvements and a local networking plan for each AIHEC college requesting this service. Qualified Native American communications engineers will be given first preference for this consulting assignment.

Because not every college is interested or is ready to use consulting services at this time, a consulting request form will be sent by the AIHEC Board's Telecommunications Committee, to be filled out by each college requesting this service. The form, which will request considerable information about existing telecommunications plans for the college, will be signed by both the college's president and the chairman of the college's governing board. Some colleges have already conducted an analysis of telecommunications

resources to serve their reservations and have completed in-state interconnection plans. Those institutions may not require this service.

The consultant(s) will work closely with the Telecommunications Planning Project Director and consulting team throughout the planning process. The consultant(s) will work with college representatives to identify potential reception/origination/interconnection sites, and to gather other pertinent information regarding both the current status of telecommunications in the college's state, as well as telecommunications plans under development.

A visit will be made to each participating college, if needed, to inspect the potential sites, meet with appropriate college and telecommunications officials, and gather additional information to employ in developing the customized interconnection plan. The plan will include projected costing information for use by both the AIHEC Telecommunications Committee and the local college in developing applications and seeking activation funding.

The following nine-step process will be employed, once each college request form has been received:

1. Forms will be forwarded to each participating college seeking additional information about current reception, origination and in-state networking status;
2. Each college will collect all previous telecommunications-related studies and analyses available, as helpful to developing a local plan, and will forward such information to the project director and consultant;
3. The advance information from each college will be assessed;
4. As necessary, each college will be visited, according to a planned agenda, for on-site technical investigation;
5. The consultant and project director will follow-up as necessary, via phone, fax and correspondence;
6. A draft of a proposed technical plan will be developed for each interested college, with alternatives and cost estimates, identifying how best to employ telephone cable, optical fiber or other distribution technologies to allow program origination, where desired, and local interconnection;
7. The draft will be reviewed with each college;
8. Plans will be revised, as necessary;
9. Plans will be finalized for the Telecommunications Executive Committee and the final report.

As the result, each participating college will have specific information so that, as funding becomes available, whether at once or over a period of time, the college will be able to see its own campus video facilities improved, its own local network developed, and both campuses and tribal reception points interconnected. In this manner, AIHEC network courses and non-credit educational and information programs can in the future be most widely employed for the benefit of both Native American college students and tribal community residents.

Objective 2:

In order to enable academic deans, faculty and staff to gain valuable experience in every facet of successful employment of television credit courses and to help prepare them for full scale networking and course sharing, AIHEC will in the second planning year pilot test several introductory college level telecourses.

Planning and delivery will be undertaken, as follows:

Participating Colleges:

All AIHEC colleges with existing downlinks or ready access to a downlink will be encouraged to participate.

Course Selection:

Deans from these institutions will be asked to form a program committee to determine selection of courses to be distributed, based upon the FY '92 academic needs study findings and course availabilities. Beginning level courses with successful records of usage will be employed for the pilot deliveries. It has been determined that Annenberg/PBS telecourses are available to the Project without charge for these testing purposes. Other course possibilities include SERC or Star Schools courses currently being offered by these satellite networks. It may be that an AIHEC college currently teaching by television will be able to extend that course to other colleges as part of the demonstration. It may also be that existing pre-produced telecourses may be used, with supplemental video and print materials provided by one of the tribal colleges, as appropriate.

Course Deliveries:

Two courses will be offered during the fall 1993 or spring 1994 terms (beginning in October and/or beginning in January).

Delivery Objectives:

These deliveries provide the opportunity to begin testing system policies regarding a number of elements essential to successful course employment, such as the following:

- Semester versus quarter employment;
- Accrediting agencies' requirements;
- Activity fee charges;
- Tuition standardization;
- ISC and institutional remuneration;
- Course registration;

- Counseling and mentoring;
- Testing and final examinations;
- Academic credit award.

Interaction:

Pilot course deliveries will offer the opportunity to begin testing different interactivity methods.

Cultural Sensitivity:

The deliveries will allow the opportunity to field test usage of pre-produced telecourses in light of cultural differences.

Course Originations:

AIHEC will contract with an existing uplink or uplinks to originate the courses for downlinking to the participating colleges.

Mentoring and Tutoring:

Several approaches to classroom mentoring and tutoring of the registered students will be investigated, including utilization techniques both before, during and after each lesson.

Delivery Evaluations:

Participating colleges will be asked to document their telecourse usage, so that other colleges will be able to benefit from the experience. Working with the Academic Planning Committee, several evaluation instruments will be developed to determine how this technology worked with students, how successful was the instruction and what additional procedures might improve the distance teaching and learning process.

Videotape Delivery:

For comparison purposes, at least one AIHEC college without a downlink will be requested to employ a course in a classroom setting via videotape instead of realtime satellite delivery.

Staff Training:

Each participating college will be requested to appoint a faculty coordinator and a campus network coordinator to participate in a special training session in advance of course deliveries. The training session will provide opportunities for practical instruction to ensure optimum delivery of courses, their employment and successful teaching and learning.

Other Academic Considerations:

Year Two will also examine the AIHEC colleges enrollment status projections and patterns relative to future course sharing.

These pilot deliveries will point the way toward the AIHEC network engaging in expanded course sharing in the future. A variety of valuable information will be generated as a result of this relatively inexpensive set of pilot demonstrations.

Objective 3:

During the 1993-94 academic year, three satellite teleconferences will be produced and distributed, working with one or more Native American service agencies. The teleconferences will be distributed via satellite to Native American viewing groups assembled at AIHEC colleges currently equipped with downlinks or at nearby downlink sites.

These pilots will demonstrate how the teleconferencing process can effectively work to share timely and specifically developed information of importance for these particular target audiences. The pilot deliveries will also allow participating colleges and their tribal communities to gain valuable experience in the interactive teleconferencing process.

Teleconference topics, scheduling and other particulars will be developed by the Project Director, working with a program committee of academic deans, a special committee of tribal representatives, and college presidents. The topics of greatest interest so far appear to be:

(1) An explanation of the proposed network and a demonstration of the potential of the network for tribal elders and leaders in the community, in keeping with the recommendations of the Academic Deans and the Project guiding philosophy.
(2) Environmental protection and/or restoration, a topic of considerable importance to Indian tribes and communities. The PERMA initiative (Promoting Environmental Restoration and Waste Management for American Indians, funded by the U.S. Department of Energy, will have significant impact on most tribes in the future. Therefore, a teleconference about the program could be very informative and of immediate interest.
(3) Teaching methodologies and learning styles of Native Americans: teaching and learning strategies for academic deans and faculty on AIHEC college campuses.
(4) An American Indian Science and Engineering Society (AISES) topic.
(5) An Indian Health Service (IHS) topic.

An AIHEC college will be asked to host each teleconference (or at least serve as the teleconference coordinator), in light of its special expertise. Outside funding will be sought to help cover the expenses of the teleconference. (For example, EPA might possibly support the expenses of a PERMA teleconference.) A modest amount of funding from the Year Two planning grant will be available to cover certain expenses.

The first portion of each such program will be presentational, with specific content provided to the viewing groups by representatives of the Native American service agency. Each pilot teleconference will be produced live. Different satellite uplinking sites will be employed to originate each of the teleconferences.

Each participating college will work with its tribal constituency to ensure a large viewing group for the teleconferences. Promotional materials will be prepared for use by each college and its tribal representatives.

Interactivity will take place by means of an 800 telephone number for participants at the viewing sites. Questions and discussion will be encouraged from each viewing site.

Print materials will be sent to each viewing site for distribution and use during the teleconferences. Participants will be encouraged to videotape each teleconference for repeated usage.

All AIHEC colleges with downlinks will be encouraged to participate. Those institutions without satellite reception capability on campus will be encouraged to form a viewing group through arrangement with a nearby public television station or non-Indian college downlink, wherever possible.

Objective 4:

The Project Director and consulting team will throughout the planning year assist the AIHEC Telecommunications Committee and Board of Directors, and AIHEC's Washington, D.C. office, as appropriate, to develop proposals and seek outside funding for both the AIHEC telecommunications network's capital equipment needs and programming and operational needs. Both private, foundation, corporate and public funding will be sought.

A special brochure and a short video will be prepared to describe the proposed AIHEC distance learning telecommunications network, its goals, objectives, organizational structure, operations and costs, and stress the network's potential.

Objective 5:

To develop a specific plan for the continued development and management of the AIHEC Telecommunications Network, including permanent and interim (if necessary) location of centralized and/or decentralized administrative offices with uplink and production facilities appropriate to support the national network. The planning effort will include an analysis of appropriate governance structures for the network as well as the pros and cons of continued affiliation with NAPBC and NET versus establishment of a separate centralized office, with support facilities and staff located on an AIHEC campus.

All five work assignments will be supervised and coordinated by the AIHEC Telecommunications Project Director, working as in Year One with the small consulting team.

The combined set of 1993 work assignments and activities will place the 27 colleges of the American Indian Higher Education Consortium in optimum position to proceed toward activation of an interconnected educational telecommunications network that will enable the sharing of credit telecourses and other educational and informational programs in an efficient and productive manner, and will enable significant improvement in the colleges curricula, teaching, learning and Native American community life.

Summary of Second Year Planning Activities

- Congress has appropriated funds for a second planning year to enable AIHEC to complete its planning for a comprehensive telecommunications network. AIHEC has submitted an amendment to its first year grant award from PTFP, specifying what will be accomplished during the second planning year.

- The academic deans adopted a Guiding Philosophy for the planning process as a way to maintain the traditional values and philosophy of Native Americans.

- Five specific objectives will be addressed during the second planning year:

  -- To develop a customized long-term plan to suggest improvements to each AIHEC college's local educational telecommunications needs, and to extend AIHEC distance learning network programming from each AIHEC college's main campus reception point to other campuses and community reception points, as well as to interconnect with in-state telecommunications systems;

  -- To generate actual academic and operational experience through pilot delivery and use of at least two telecourses in each of two successive terms;

  -- To gain additional experience through delivery and employment of at least three satellite teleconferences presented in cooperation with one or more Native American service agencies;

  -- To develop informational materials describing the new AIHEC distance learning network and seek external capital and operational funding to see the network become a reality; and

  -- To develop a specific plan for the continued development and management of the AIHEC Telecommunications Network, including permanent and interim (if necessary) location of centralized and/or decentralized administrative offices with uplink and production facilities appropriate to support the national network.

XI. POTENTIAL AIHEC NETWORK FUNDING SOURCES

Once a specific AIHEC distance learning network plan has been formally approved and endorsed by both AIHEC and its member colleges, the subject of financial support must be addressed and solicitation plans developed. A range of potential funding sources can be pursued, especially in view of success stories of national educational telecommunications network such as the National Technological University, SERC and AG*SAT. They have paved the way in showing how teaching and learning can be improved and equal educational opportunities can efficiently be provided. AIHEC can build upon these successes.

In considering various ways both capital and operational funding might be secured, one imperative must be kept in mind: current funding for AIHEC colleges must be protected. These funds are critical to the continuing work of the colleges. A diminishing or redirecting of these funds could mean loss of the very institutions that the AIHEC network is intending to help.

Concurrent plans should be developed to pursue a range of potential funders. AIHEC will need to tailor its requests according to the interests of each particular funder, such as: grants to meet specific educational objectives; services the AIHEC network could provide under contract; capital equipment in support of expanding AIHEC colleges' telecommunications capabilities; program development support; funding for programs designed to train specific target audiences; and, AIHEC partnering with existing projects to disseminate information and address projects' objectives more appropriately through the telecommunications network.

Funding Phase I Implementation

Section IX concludes that the total of $2.1 million is needed to fund the initial implementation of the network. This sum includes funding for both capital equipment, personnel for campus network coordination, and modest first year operational funding. This funding must be secured as an important first step in the activation of the network. Once this foundation is in place, the opportunities for expansion funding are significantly increased.

Special Congressional funding was provided to enable AIHEC to undertake the Telecommunications Planning Project that generated this report. It is therefore appropriate that AIHEC request special Congressional authorization and appropriation to fund the initial AIHEC distance learning network implementation phase, as recommended by this report. Just as the special federal planning funding was provided through the Department of Commerce's Public Telecommunications Facilities Program, so too should this first implementation funding be provided through PTFP, for continuity of administration.

The Clinton Administration has most recently proposed $64 million in supplemental funding for PTFP for fiscal year 1993, for purposes of national telecommunications infrastructure planning and construction. Funding for the initial implementation phase could

be sought from this supplemental appropriation. But, as has been stated earlier in this report, AIHEC colleges are in no position to be able to provide local matching funding to secure a federal grant. Either a waiver would have to be sought in this instance, or matching funds would need to be provided through another source.

The new Administration has also recommended special telecommunications infra-structure funding through PTFP for fiscal years 1994 through 1997. Special funding should be pursued in these years to allow systematic expansion of the AIHEC network's interconnection, origination, reception and programming development capabilities.

Future Funding and Private Foundations

The AIHEC development plan should consider special requests of foundations such as the Ford Foundation, the Carnegie Endowment, Pew Charitable Trusts, and the Kellogg Foundation, known to have special interest in American Indian students at the elementary/secondary, postsecondary and graduate educational levels, in economic development, in training of adults on Indian reservations, etc. The network will be available to work with these partners to reach audiences that are difficult to reach without telecommunications.

Future Funding And The Corporation For Public Broadcasting

The Corporation for Public Broadcasting has long been a financial supporter of the Native American Public Broadcasting Consortium and, with CPB's new increased interest in educational telecommunications, should be interested in supporting the AIHEC network. Most recently, CPB has contributed $460,000 for program development for the new American Indian Radio On Satellite network project. CPB's Education Division should be made aware of the full potential of the new AIHEC distance learning network and urged to join in its support.

In the same regard, the CPB/Annenberg Program has expressed interest in supporting the AIHEC network. The Program has already waived all fees for use of its college telecourses so that AIHEC colleges can test the feasibility of these pre-produced materials for Native American learners. Further support may be possible.

Future Funding and Government Agencies

A number of government agencies are funding programs directed to the education and training of Native Americans. The Senate Select Committee on Indian Affairs in 1991 published a 300-page report entitled "Federal Programs of Assistance to Native Americans". While most of these programs have no relationships to telecommunications, many do have training components which could take advantage of AIHEC network resources on a contractual basis and should, therefore, be seriously considered. Following is a partial list of potential programs for purposes of illustration.

- Department of Education.

  -- Office of Indian Education. Two programs in the office of elementary and secondary education are designed to improve educational opportunities for Indian children and adults. The adult program targets literacy and basic skills. The AIHEC network could work with recipients, or apply directly to use telecommunications to expand the impact of these programs.

  -- Office of Vocational and Adult Education. At least two programs should be considered. For vocational education, special funds have been appropriated to provide training to Indian adults to help eliminate high unemployment. The network might provide a way to disseminate that training. A second program addresses gifted and talented students not specifically for Indian organizations. However, the program includes pre-service and in-service training for teachers for talented and gifted students--training that the AIHEC network might disseminate.

  -- Star Schools Program. Although this program is designed for technology demonstrations and projects for K-12, college partnerships are valued. AIHEC colleges could work with K-12 schools serving Native American students to develop teacher training and student courses. Star Schools funds can be used for capital as well as operational expenses.

- Department of Energy.

  -- Minority Undergraduate Training for Energy-Related Careers is a possibility. Currently, grants between $75,000 and $100,000 are available to institutions to encourage minority students to select energy-related fields of study. The AIHEC network might aggregate several such grants and develop a program for use at a number of AIHEC institutions;

  -- Project PERMA. This Promoting Environment, Restoration and Waste Management for American Indians initiative might employ the network for teleconferences and, possibly, a telecourse.

- Department of Health and Human Services.

  -- Administration for Native Americans. This program funds projects that will make the greatest impact in promoting social and economic self-sufficiency. The network might help facilitate joint training and information exchange among various tribes.

  -- Administration on Aging. The network might be used to develop and disseminate nutritional services for older Native Americans, as described in the grants for Native American program.

-- Public Health Service. The Health Professionals Recruitment Program for Indians might use the network for on-going recruitment and support services.

-- Office of Substance Abuse. Several AIHEC colleges have model substance abuse training programs in place. The network could explore with these colleges the possibility of securing additional funds to provide training via the network.

-- Head Start. Under a three year demonstration project, Head Start is funding the use of satellite technology to provide training for Head Start workers on Indian reservations. Several AIHEC colleges are already participating in this program which might be expanded through support from the AIHEC network.

-- Indian Health Service. There is widespread agreement that many of the training needs of Indian health workers could be addressed via a telecommunications network, if such a network were in place. The AIHEC network is an ideal dissemination vehicle to meet this objective.

- Department of the Interior: Bureau of Indian Affairs.

Tribal Government
- Community Services
- Consolidated Tribal Government Programs
- Self Governance Compacts
- Tribal Government (Tribal Design)

Human Services
- Social Services
- Indian Child Welfare Act
- Direct Employment
- Adult Vocational Training

Public Safety and Justice
- Tribal Courts
- Law Enforcement
- Community Fire Protection
- Environmental Quality Services

Other Trust Services
- Indian Rights Protection
- Water Rights Negotiation Litigation
- Attorneys Fees
- Unresolved Rights Issues

General Administration
- Executive Direction and EEO
- Administration
- Financial Management
- ADP Central System Support
- Indian Gaming

Education
School Operations
Early Childhood Development
Student Transportation
Solo Parent Program
Johnson O'Malley Education Assistance Program

- Department of Labor.

  -- Employment and Training Administration. The AIHEC network could work with existing training organizations to extend both reach and effectiveness.

- Environmental Protection Agency.

  -- Program funding might be available for special environmental teleconferences for students and adults.

  -- SATA Title III Training Grants. Program development funding might be available for training tribal members having hazardous materials preparedness and response duties.

- National Endowment for the Arts. AIHEC colleges might work with NEA grant recipients to disseminate artistic works through the network.

- National Endowment for the Humanities. Similar dissemination of humanities-based programming could be possible.

- National Science Foundation.

  -- Career Access Opportunities in Science and Technology. This ACCESS program is designed to improve the availability of under-represented groups to careers in science and technology. Telecourses as well as teleconferences might be planned for distribution of the network.

  -- Alliances for Minority Participation. This program funds coalitions that focus on improving the quality of the minority educational experience. A coalition could emerge from AIHEC network colleges.

- Small Business Administration.

  -- Management and Technical Assistance for Disadvantaged Businesses. The AIHEC network could provide training for Native American adults to improve skills and provide other information necessary for succeeding in business.

- Department of Commerce.

  -- Public Telecommunications Facilities Program. The basic PTFP was designed by Congress to provide matching funds to build educational telecommunications facilities. In the future, should certain AIHEC tribal and BIA colleges have local matching funds, applications could be made to this once per year program for up to 75% federal matching grants for equipment purposes.

  -- Economic Development Administration. The Planning Assistance Program and the Special Economic Development and Adjustment Assistance program provide funds to help create jobs, including funding for training. These programs might fund special programs aired on the network targeting special employment needs of the AIHEC-member tribes.

  -- Minority Business Development Agency. The Indian Business Development Center program might use the network on a contract basis to expand its effectiveness.

Future Funding and Corporations

In addition, certain major private U.S. corporations have supported Native American education and development through the years. These companies will be apprised of the new distance learning network and its growing potential to assist the betterment of Native Americans across the country.

Future Funding and Indian Organizations

AIHEC will investigate various American Indian organizations that might logically support the AIHEC network to further their missions, working in close relationship with AIHEC colleges for production and curriculum support. These organizations might effectively partner with individual colleges and the network both to address the organizations' existing objectives and missions, and to solicit additional funding, if necessary. The following agencies and organizations have been mentioned by AIHEC college representatives throughout the planning year; certainly others can be added:

- American Indian Science and Engineering Society (AISES), funded by the National Science Foundation; AISES has already expressed interest in working with the network;
- National Congress of American Indians;
- National Indian Policy Center;
- National Indian Educational Association;
- American Indian College Fund;
- Native American Allied Organization;
- National Museum of the American Indian;
- Individual tribal councils.

Several tribal councils have already become involved in telecommunications through activities on their reservations. Once the initial implementation phase is completed, the task of expanding the reach of the network to multiple points on reservations will need to occur in continued partnership with the tribal councils.

Funding sources and funding program partners mentioned are mentioned here as only a point of departure. As AIHEC planning continues, additional sources will most certainly emerge. Many of the states in which AIHEC member colleges are located are implementing statewide telecommunications networks and are connecting with tribal and BIA-operated colleges through these plans. This means that the AIHEC colleges will have access to statewide resources, as well as national resources, to enhance their educational offerings. This resource can only expand, as other states develop their in-state telecommunications plans. The end result is a continual expansion of the availability of additional resources for those who educate Native American learners in this country.

Summary of Recommendations for Potential AIHEC Network Funding Sources

- Various ways to obtain both capital and operational funding must be explored. It is clear that current funding for AIHEC colleges cannot be used to activate the network. A diminishing or redirecting of existing funds could mean loss of the very institutions that the AIHEC network is intending to help.

- AIHEC will request a special Congressional authorization and appropriation to fund the initial network implementation phase, administered through the Public Telecommunications Facilities Program. Perhaps these funds can be requested under the recent supplemental funding for PTFP recommended by the Clinton Administration.

- With the implementation of phase one equipment and services, AIHEC is in a strong position to secure additional funding from a variety of sources.

- On the basis of their history of supporting Indian-related projects, teacher training and technology-based education initiatives, several specific foundations and U.S. corporations will be approached by the AIHEC network for programming and operational support.

- A number of government agencies already involved in funding programs to meet the educational and informational needs of Native Americans (e.g., the National Science Foundation and the U.S. Departments of Health and Human Services, Education, Interior, Energy and Commerce) will be approached for program and expansion support. In some cases, services could be rendered to these agencies on a contract basis with the AIHEC network.

- A number of Indian-related organizations have already been contracted about the possibility of working with the network for educational and information dissemination purposes; these conversations will continue.

XII. FUTURE AIHEC NETWORK DEVELOPMENTS

The first implementation phase of an AIHEC Telecommunications Network outlined in Section IX puts into place the foundation necessary to begin to serve the educational and informational needs of AIHEC colleges and the communities they serve. But this empowerment is just the beginning. The future potential is virtually unlimited.

In the months and years ahead, the AIHEC network will have the opportunity to continue development in several important areas:

- the installation of additional state-of-the-art technology;
- building relationships with other networks and organizations;
- innovative programming to meet specific needs;
- operational policies and procedures consistent with Native American values and traditions;
- serving Indian communities that do not have tribal colleges, and;
- long range plans that can ensure the economic and viability of the network.

Each is briefly discussed below.

Technological Advances

The recommendation for phase one network implementation provides a broad foundation for each of the AIHEC-member colleges. With this basic package, each college can participate actively in distance education programming originating from a variety of sources. Several AIHEC colleges already have classroom studios or other program production equipment that can be used to create programming within months of activating the network.

In the future, production equipment as specified by the colleges will be secured (either stand alone videoconferencing systems for low-budget productions or more elaborate TV originating classrooms). This production equipment is likely to be phased in depending upon each college's ability and interest in providing programming for the network. The installation of this equipment will likely coincide with the installation of several state-wide fiber optic and microwave systems, which means that the individual colleges will be able to use the equipment not only for AIHEC networking but in-state networking as well.

Future planning will also include a strategy for making equipment available for multi-campus colleges and those colleges who wish to place receive sites at critical points on their reservations. These local area networks are critical, if the AIHEC colleges are to be successful in meeting the educational and informational needs of their tribes. In some cases the tribes could help fund and operate these additional sites; in other cases, the additional sites may be the sole responsibility of the colleges and seen as branch campus operations.

Finally, future equipment will include digital format compressed video equipment so that, within the next few years, much more cost-effective satellite transmissions may occur. Although the costs for satellite time on a compressed video transponder are still fluctuating,

it is likely that the costs could be as little as one-tenth the cost of a full transponder. An added benefit of the compressed video equipment is the ability to send a television signal from a producing college classroom studio to the closest satellite uplink by T-1 or T-3 telephone lines, thereby eliminating the need to install expensive satellite uplinks at each college. As explained in Section VI, it is not anticipated that satellite uplinks will be placed at AIHEC colleges, at least initially; a more cost-effective approach is to connect colleges to existing satellite uplinks within reach of the colleges.

Meanwhile, great advances are being made in the application of VSAT (Very Small Aperture Terminal) technology for educational use. Within a few years, this technology will make it possible for data and some level of digitized video to be uplinked directly from each AIHEC college campus, thereby eliminating the need for long distance telephone lines. VSATs could be installed at each AIHEC college in the future, along with the appropriate reception equipment for each campus.

The Clinton Administration has already issued a policy statement declaring its intent to support development of a "superhighway" for telecommunications--specifically telecomputing. Just in the past six years the national educational computer network, Internet, has become almost indispensable for faculty and students at institutions of higher education who have had a chance to participate. A commitment on the part of the federal government for funding of equipment, and the development of services, will ensure that there is financial support available, as AIHEC moves toward being a full user of these services.

With the mix of satellite technology, VSATs, computer technology, and statewide T-1, cable and fiber optic networks, AIHEC colleges will be on the leading edge of educational telecommunications, offering a way for students, faculty and staff to be in touch with the educational resources they need, when they need them. AIHEC will monitor closely the revolutionary changes in telecommunications technologies that are likely to occur over the next few years, in order to ensure that equipment purchases lead to an integrated network system. The members of the AIHEC Telecommunications Operations Committee will assist in monitoring these developments.

Liaisons With Others

A variety of government and non-government agencies and organizations were mentioned in Section XI as potential funding and programming partners for the new network. Each of these relationship will be critical for the acceptance and use of the network--not just by AIHEC colleges but for all of Indian country.

The AIHEC network will be able to serve the needs of Native Americans across the country, linking rural communities that have had little connection with one another. Training for Council Chairs and those involved in the Native American judicial system, land use and other critically important areas of interest for Indians will be available in the future via the network.

Of special interest is the possibility of working with the newly developing American Indian Radio on Satellite System (AIROS). This new consortium will produce and distribute radio

programming for use by Native American radio stations in 11 states: New York, Wisconsin, North and South Dakota, Alabama, North Carolina, New Mexico, Arizona, Oregon, California and Alaska. AIROS will enable public radio stations on one reservation to receive and broadcast programming from another reservation in a distance state. The AIHEC network may find very innovative ways to make some of the educational programming it develops available for broadcast via the AIROS stations to Native Americans across the country.

Innovative Programming

Interim Report #6 outlined eight broad categories of programming that could appear on the AIHEC network. Within each of these categories, AIHEC colleges will be developing innovative programs and courses to meet the special learning and informational needs of Native Americans. Because the costs of satellite time will be dropping dramatically as a result of compressed video, the ability to co-teach a course with faculty located in two different states is suddenly a realistic possibility. And, the chance for students to use the network to stay in touch outside class will be economically viable.

Programming designed for the non-campus learner will likely demand the most innovation. Adult learners are busy, not usually confident in classroom situations, and not usually comfortable with technology. And yet, the AIHEC network can provide the training they need for employment, better parenting, and updating of information and skills. So, AIHEC colleges will be working in several program areas to provide innovative approaches to learning, using the technology.

Operational Policies and Procedures

During the Year Two Planning Project, AIHEC will be testing a number of policies and procedures for implementing the network. AIHEC colleges serve very diverse populations, each with their own tribal customs and traditions. For example, each of the colleges has local reasons for when their school year begins and ends; the network must remain flexible enough to honor these decisions.

AIHEC will draw from the experience of other distance learning networks in setting up flexible policies in which each college can operate in accordance with their local mandates. To the extent possible, the interactivity provided through computer on-line systems will help meet the need for students and faculty to stay in touch, even if they cannot participate live in a televised course.

Service to All of Indian Country

The AIHEC distance learning network can be a tremendous resource for all of Indian Country. A number of discussions have already taken place with Indian organizations serving the needs of Native Americans working in a variety of fields, including engineering, health care, social services, K-12 education, and math education. The network will be available to link these professionals with one another for continuing education purposes.

As the use of satellite communications increases, many tribes will be installing their own receive equipment which can then receive programming from the AIHEC network. This will likely be of greatest use to tribal councils, governments and those in the tribal judicial systems. Finally, Native American students attending non-Indian colleges and universities can be served through the network, as well.

The AIHEC network will be in a position to offer training and informational programming to the broader Indian population within months of the first phase implementation of the network.

Long Range Business Planning

The AIHEC network must be economically viable. Within the first year of implementation, AIHEC will develop a long range business, operational, programmatic, staffing and organizational plan to ensure that all possible funding sources are contacted and that, as appropriate, user fees are developed that are consistent with the ability to pay. Every distance education network must find ways to help their member institutions pay for the added expense of participating in the network. The AIHEC network is no exception. Sometimes the additional cost can be covered by a reduction in expenses as a result of network services. More often than not, outside funding must supplement existing funds to make the network viable. Eventually, AIHEC colleges will have to consider their own investment in this cooperative educational service.

Through the First Year Planning Project, AIHEC has developed important partnerships that will be helpful in the long range planning process. The staff at the Public Telecommunications Facilities Program and at the Public Broadcasting Service have been particularly helpful over the past year, and will be called upon again to assist in the long range planning process. Congressional staff who have a valuable overview of the role that telecommunications can play in education will be called upon. And, members of the AIHEC Board and representatives from other Indian-related agencies will be asked to participate in developing a plan that takes into consideration a wide range of users and producers.

Summary of Future Developments for the AIHEC Telecommunications Network

- Additional state-of-the-art technology will be placed at each AIHEC colleges as need and resources dictate, including additional receive sites for multiple campus and community locations, production equipment, compressed video equipment, Very Small Aperture Terminals (VSATs), links to fiber optic and microwave networks, and computer technology.

- Relationships with other networks will provide expanded program options to the AIHEC colleges as well as the possibility of working in partnership with others to secure funding for AIHEC-produced courses and programs.

- Innovative programming using several types of technology will be developed to meet the specific needs of Native American students, faculty and staff, and tribal leadership.

- Operational policies and procedures consistent with Native American values will be developed. When possible, the network will draw upon the experience of other distance learning networks; however, many unique features of AIHEC colleges and their students will require considerable flexibility in whatever policies and procedures are adopted.

- AIHEC will look for ways to serve Indian communities that do not have tribal colleges, including urban centers with large Indian populations; and

- The network will develop long range plans to ensure the long term economic viability of the enterprise.

XIII. APPENDICES

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APPENDIX A

AIHEC BOARD OF DIRECTORS AND OFFICERS*

Martha McCleod
President
Bay Mills Community College

Carol Murray
President
Blackfeet Community College

Joe Lends His Horse
President
Cheyenne River Community College

James Tutt
Chancellor
Crownpoint Institute of Technology

Carlos Cordero
President
D-Q University

Dr. Art McDonald ***MEMBER-AT-LARGE****
President
Dullknife Memorial College

Lester "Jack" Briggs
President
Fond Du Lac Community College

Margaret Perez **SECRETARY***
President
Fort Belknap Community College

Lyn Pinnick
President
Fort Berthold Community College

Dr. James Shanley ***VICE PRESIDENT****
President
Fort Peck Community College

Bob Martin
President
Haskell Indian Junior College

Kathryn Harris Tijerina
Institute of American Indian Arts

Dr. Jasjit Minhas
President
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Janine Pease-Windy Boy
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Little Big Horn Community College

Dr. Merril Berg
President
Little Hoop Community College

Tommie Lewis
President
Navajo Community College

Ms. Thelma Thomas
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Nebraska Indian Community College

Dr. Robert Lorence
President
Northwest Indian College

Dr. Elgin Bad Wound
President
Oglala Lakota College

Dr. Joseph McDonald
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Carolyn Elgin
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Southwest Indian Polytechnic Institute

Ron McNeil
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Standing Rock College

Peggy Nagel ***TREASURER****
President
Stonechild Community College

Gerald "Carty" Monette
President
Turtle Mountain Community College

Dr. David Gipp ***PRESIDENT****
President
United Tribes Technical College

Georgianna Tiger ***EXECUTIVE DIRECTOR****

APPENDIX B

AIHEC TELECOMMUNICATIONS PLANNING PROJECT
COLLEGE REPRESENTATIVES

Martha McCleod, President
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George Heavy Runner
Telecommunications Technician
Blackfeet Community College

Joe Lends His Horse
President
Cheyenne River Community College

Dan Hankson
Head of Computer Science Dept.
Crownpoint Institute of Technology

Carlos Cordero, President
D-Q University

Russ Lundgren
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Jack Briggs, President
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Fond Du Lac Community College

Harold Heppner
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James Rauser
MIS Director
Fort Berthold Community College

Rich Peterson
Fort Peck Community College

Marilyn K. Bread
Education Development Specialist
Haskell Indian Junior College

Nedra Darling, Director of Native Images
Gloria Emerson
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Annette Wiggins
Academic Secretary
LacCourte Orielles Ojibwa Comm College

Carson Walks Over Ice
Little Big Horn Community College

Erich Longie
Academic Dean
Little Hoop Community College

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Carol McKissack
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Peggy Nagel, President
Henry Webster
Stone Child Community College

Mike Belgarde
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Jill Feist, Computer Specialist
Jack Barden
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APPENDIX C

AIHEC TELECOMMUNICATIONS PLANNING PROJECT
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ACADEMIC DEANS COMMITTEE

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APPENDIX C

AIHEC TELECOMMUNICATIONS PLANNING PROJECT
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APPENDIX E

PROFESSIONAL WORK EXPERIENCES
(current to past)

EDWARD LONE FIGHT
Superintendent
Mandaree Public School
Mandaree, North Dakota 58757
July, 1990 - June 30, 1992

As Superintendent of Mandaree School I provided the overall management functions for the school. The policy and directives are formulated by Mandaree School Board, Department of Public Instruction, Tribal Business Council and Bureau of Indian Affairs. Mandaree School is a Grant school under the authority set forth in Public Law 100-297, and a public school with accreditation by Department of Public Instruction in both the elementary and secondary programs. The academic and facilities are under the grant provisions, and the non-educational facilities portion is under Public Law 93-638 contract. The school has a budget of $2.3 million and a student enrollment of 215 students.

During the first two months of my tenure, the efficiency goal of getting all school operations under one leadership was realized when I effectively met all of the requirements for the school to go grant for the facility portion. Also, accreditation was achieved for the elementary portion of the school. In 1992, I successfully made application for new school construction and met all of the requirements stipulated in the application procedures. Under my management, the ISEP student enrollment count increased from a count of 176 to 215 students, additionally the school budget increased by $800,000.

Tribal Chairman
Three Affiliated Tribes
Fort Berthold Indian Reservation
New Town, North Dakota 58763
1986-1990 (four year term of office)

I was elected at large by the people of the Mandan, Hidatsa, and Arikaree Tribes to serve as Tribal Chairman of the Three Affiliated Tribes. The boundary of the Fort Berthold Indian reservation encompasses approximately one million acres of land situated in 6 state counties. The reservation is located along the Missouri River in western North Dakota, and has a tribal enrollment of over 9,000 members.

In the capacity of Tribal Chairman, my responsibilities were diverse, complex and far reaching. I represented the Three Affiliated Tribes in local, state and national arenas on major issues such as appropriations; just compensation for the taking of 156,000 acres of prime bottom land for the creation of the Garrison Dam, national legislation for farmers and ranchers; repatriation of ancestral human remains and associated grave goods; tribal

sovereignty and jurisdiction. I provided numerous testimonies, as well as serving as keynote speaker at various meetings, workshops and conferences. Additionally, I was selected to address the House of Representatives and the Senate at the North Dakota legislature on the state of the Indian relationship. I was also elected to serve on a number of boards and executive committees such as the National Congress of American Indians, Council of Energy Resource Tribes and the United Tribes Technical College. There were many new developments under my administration ranging from economic development programs, diabetes project, solid waste management, to the creation of a Tribal Education Department. At the end of my 4 year term, I chose not to seek re-election.

School Guidance Counselor
Mandaree Public School
Mandaree, N.D. 58757
1984 - 1986

In this position I provided all the services involving guidance and counseling to students in grades K-12. I assisted in establishing community projects such as Alateen for Mandaree youth; coordinated and participated in several reservation wide youth survival camps. Additionally, I developed and assisted with activities which were set up as alternatives to alcohol and drug abuse. I administered standardized tests for the entire school, moreover, I analyzed and interpreted the student test scores for teachers, parents, school board members, and students.

Education Specialist,
Tribally Controlled Community Colleges
(TCCCs)
Office of Indian Education Programs
18th and C Streets NW
Washington, DC
1981 - 1984

As an administrator of the recently enacted Tribally Controlled Community Colleges program, I had to create many administrative measures to carry out the provisions of the Act for the Office of Indian Education Programs. I conducted administrative reviews with TCCC's for continued funding as well as approval for new funding under the Act. I prepared budget justifications for Higher Education Grant Program, TCCC's, and Adult Education Program which were in the $66,000,000 millon range.

Superintendent
Chemawa Indian School
Salem, Oregon
1973 - 1981

I served as Superintendent of the Off-Reservation Boarding School at Chemawa Indian School. In this position I coordinated the efforts of 200 staff members to carry out the functions of the residential school facility. The facility operated on a 24 hour, 7 days per week basis for students in grades 9-12. The first 5 years of my tenure the enrollment was set at 800 students. The last 4 years the enrollment was set at 400 students. During my tenure, a new facility was construction at a cost of $21 million; a school program review was conducted to re-direct the school by changing the mission, philosophy, curriculum, goals and objectives; school budget went from an incremental budgeting system to a student based formula; and all the requirements for accreditation were fulfilled.

Superintendent
Riverside Indian School
Anadarko, Oklahoma
1971 - 1973

I provided the day to day supervision of Riverside Indian School which is a federal boarding school for Indian students. The 9-12 student enrollment was set at 300. I supervised 5 department heads, which included Principal, Pupil Personnel Services, Food Services Manager, Administrative Manager, and Facility Manager.

Supervisory Education Specialist
Chemawa Indian School
Salem, Oregon
1970 - 1971

I worked with professional Guidance Counselors, Security Staff, Recreational Staff, and 5 Dormitory Staff for 800 students of the residential portion of the school.

Teacher Counselor
Phoenix Indian School
Phoenix, Arizona
1967 - 1970

In this position I worked as guidance counselor and also served as supervisory of two dormitory staff with student enrollment in 7th and 8th of 250 students.

High School Science Teacher
Standing Rock Community School
Fort Yates, North Dakota
1964 - 1967

I served as the science teacher and assisted in coaching duties in Basketball, Football, Track and Cross Country for the school. In addition, I had a bus drivers license to drive buses for school sponsored activities.

QUALIFICATIONS:

High School Diploma: Mandaree Public School

Bachelor of Science: Dickinson State University

Master of Arts in Education: Arizona State University

Master of Public Administration: Portland State University

Superintendent's Certificate Program: University of Oklahoma

Superintendent's Credential: DPI, expires 7/11/96

Secondary School Principal's Credential: DPI, expires 6/27/94

Professional Guidance Counselor's Credential:DPI, expires 9/1/92

Selected Professional Activities

Task Force Member - 1976, Oregon Indian Education

Task Force Member - 1977, Indian Equalization Program (ISEP) assisted in the development of the formula to provide equitable funding for all Bureau funded schools under Public Law 95-561.

Panel speaker - On wide range of topics dealing with such broad areas as education, water policies, fmha issues, ranching and livestock items, and divergent topics in front of general and special interest groups.

1987 - 1990, Developed and Organized the Fort Berthold Indian Dance Club which performed at Seminole Tribal Fair, Fort Lauderdale, Fl. Union Station, Washington, DC., through out the State of North Dakota.

Selected to the HALL OF FAME at Dickinson State University - 1989.

1988- 1990 Elected to serve on the Mandaree Public School Board to provide policy direction for the school.

Special Training

1. Seminar for Federal Executives GS-14 and above at University of California, Berkeley, 4 week course.
2. Effective Letter Writing course.
3. Transactional Analysis for Managers.
4. Fraud, Waste, and Abuse for Federal Employees.
5. Time Management for Managers.
6. Micro Computers for Federal Managers.
7. Union Negotiators for Managers.
8. School Board Training NESBA.
9. School Board Training North Dakota School Board Association.
10. The Educator and the Law.
11. National Indian Justice on Tribal Appellate System.
12. Audits under OMB Circulars on Contracts and Grants.

APPENDIX F

AIHEC TELECOMMUNICATIONS PLANNING PROJECT

PROJECT TIMELINE (Revised)

March 1, 1992	AIHEC Proposal Submitted to PTFP
March 3	AIHEC Board Telecommunications Committee Meeting
April 15	PTFP Planning Grant Awarded
May 1	AIHEC Telecommunications Planning Project Activated
May	**Phase I:**
	Project Director Recruitment Begins AIHEC Academic Planning Committee Activated AIHEC Technical/Operations Committee Activated AIHEC Project College Coordinators Designated NAPBC/NETC Consulting Team Established PTFP/PBS/NAPBC Project Planning Meeting
May 12	1st Academic Planning Committee Meeting
	Technical Facilities Inventory Planning Colleges Course & Curriculum Materials Collected Academic Needs Survey Planning Telecommunications Planning Conference Planning Finalized
May 29-30	AIHEC Telecommunications Planning Project Conference
June	Continued Project Development Colleges Course Catalogues and Curricula Compared Continued Project Director Recruitment Technical Consultant Appointed
July 6	Special Program Report to Senate Select Committee and PTFP
July 8	AIHEC Project Director Begins
	Materials Preparation

July 13-14	AIHEC Presidents Meeting & Board Telecommunications Executive Committee Meeting: Project Report
July 17	**1st Deliverable:** Project Organization, Activation and Program Planning Report Campus Visits
August	AIHEC Alternative Telecommunications Technologies/Delivery Systems Analysis Campus Visits
August 11	Telecommunications Facilities Surveys to Campuses Data Collection Begins
August 24	Academic Needs Assessment Surveys to Campuses
August 25	AIHEC Project Workshop Videocassette Produced
August 28	Distance Learning Video & Print Tutorial Materials to Campuses
August 28	**2nd Deliverable**: Interim Report #2-- AIHEC Alternative Telecommunications Technologies/Delivery Systems Analysis
September 4	AIHEC College Campus Workshops Begin Academic Needs Surveying Begins
September	Campus Visits Project News Releases Collection of Telecommunications Facility Surveys Development of College Telecommunications Facilities Profiles Project Budget and Work Schedule Revisions Completed Phase II Revised Budget and Work Schedule Submitted
October 1 **Phase II**	
October 11-15	Campus Visits

October 16	Campus Project Workshop Reports Collected Analysis of Facilities & Workshop Data
October 30	Academic Needs Assessment Surveys Returned Submission of Quarterly Performance Report
November 1-3	Campus Visits
November 15	AIHEC Board Meeting Report
November 15-16	AIHEC Project Meeting: Campus Coordinators and Administrators
November 17-18	National Indian Education Association AIHEC Project Workshops
November 19	NIEA/AIHEC Project Teleconference: Part I & Part II
November 25	Collation and Evaluation of Academic Needs Assessment Data
December 4	**3rd Deliverable**: Interim Report #3-- Telecommunications Facilities Campus Profiles
December 8-9	Meeting with NTIA and Consultants
December 14	**4th Deliverable:** Interim Report #4--Campus Workshop Summaries
December 15	Technical/Operations Committee Meeting Review AIHEC Colleges Telecommunications Facility Needs
December 16	Develop Academic Needs Assessment Proposed Programs Recommendations
December 22	**5th Deliverable**: Interim Report #5-- Potential AIHEC Colleges Initial Phase Networking Delivery System (Components of the Network System)
January, 1993	
January 3-8	Additional Campus Visits
January 6	**6th Deliverable**: Interim Report #6-- Potential AIHEC Telecommunications Network Program Service Types

January 15-16	AIHEC Colleges Academic Deans Meeting Review of -- Needs Assessment Data -- Needs Assessment Draft Conclusions -- Program Service Recommendations
January 17	Telecommunications Executive Committee Meeting
January 25	Summary Information Sent to AIHEC Board
January 31	Submission of Quarterly Performance Report
February 1	Board Telecommunications Executive Committee Meeting
February 2	AIHEC Board Meeting Project Status Report to Presidents Year 2 Work Assignments Year 1 Final Report Discussion Telecommunications Executive Committee Meeting
February 2	Planning Meetings: Project Director Project Coordinator NTIA/PTFP PBS
February 3-21	Year 1 Final Report Drafting Year 2 Grant Amendment Drafting Additional Programmatic, Operational, Technical, Organization and Fiscal Conceptualization and Investigation
February 22	Year 1 Final Report 1st Draft and Year 2 Grant Amendment Draft sent to Telecommunications Executive Committee for study
February 28 - March 11	Continued Work on Final Report Draft
March 3	Telecommunications Executive Committee meeting to review Year 1 Final Report 1st Draft Materials and Year 2 Grant Amendment Draft
March 5	**7th Deliverable**: Interim Report #7-- AIHEC Colleges Academic Needs Assessment Conclusions and Program Considerations

March 9	Final Report 2nd Draft sent to Telecommunications Executive Committee for review
March 12	Year 2 Grant Amendment Proposal sent to PTFP
March 16	Telecommunications Executive Committee Meeting to review Draft 2
March 17-18	Report Revisions
March 22	Final Report 3rd Draft sent to all AIHEC presidents, academic deans and campus representatives for campus review
April 3	Telecommunications Executive Committee Meeting
April 4	AIHEC Board of Directors Meeting Final Report Presentation and Review
April 5 -12	Final Report Revision and Duplication
April 13	**Project Deliverable**: Final Project Report and Recommendations to PTFP, Departments of Commerce, Education, Interior and to Congress
April 15	Year 2 Planning Activities Initiated

APPENDIX G

SAMPLE COURSE AND TELECONFERENCE BUDGETS

The following sample budgets were assembled from actual budgets submitted for funding to several funding sources. The first section lists budget for several live, interactive telecourses to be delivered via satellite. The second section lists budgets for several teleconferences.

These are production budgets only and do not include (1) the long distance telephone expenses (which will run about $500 per course per semester), (2) the cost of the satellite transponder (which will cost about $200 an hour), nor (3) the expenses associated with uplinking the course to the satellite. The uplinking expenses will vary considerably from location to location depending upon the arrangements that can be made with nearby uplinking facilities.

Live, Interactive Satellite Telecourses

o **Feedlot Management for Undergraduates via Satellite**

This semester course would be developed during two consecutive semesters and would be delivered via satellite during both semesters of the following year. The budget for the two-year project was as follows:

Salary and Wages	
Professor	$16,000
Graduate Student/Secretary	10,500
Materials and Supplies	
Slide generation	
(600 slides @ $10 each)	6,000
Videotape purchases (10 @ $50)	500
Travel to Feedlots	1,000
Budget for Videotaping	
8 field trips (@$350)	2,800
42 lectures (@$100 each)	4,200
TOTAL	$41,000

o **Lactation Physiology via Satellite**

The budget below is designed for senior level students with background in the animal sciences. The work proposed includes development of necessary course materials and

actual production and transmission via satellite of the course lectures. Specifically: develop and produce a lactation physiology course for satellite delivery; develop a set of bound lecture notes/outlines to accompany the televised lectures; develop a set of slides-tapes and/or videotapes to serve as auto-tutorials for selected segments of the course; and prepare a bank of practice examine questions to be used by students for self-testing.

Salary and Benefits	
Professors	in-kind
Students (280 hours @ $5)	$ 1,400
Studio, transponder, uplinking with support staff (135 hrs @$350)	47,250
Indirect costs (36%)	17,514
Total	$66,164

o **Teaching Scientific Swine Production via Satellite**

This three-semester credit course in scientific swine production is designed to be a capstone course for juniors and seniors in animal science programs.

	Request	Match
Salaries and Wages		
Instructor for 1 Year		$12,513
Teaching Asst.- 9 months		4,378
Timeslip	1,000	
Benefits	50	3,472
Materials and Supplies	4,950	2,000
Other Costs		
Subcontracts to 5 coops	7,500	
Transponder time 46 hr @$400	18,400	
Uplink services 46 hr @$100	4,600	
Studio Time 46 hr @$100		4,600
Graphics & video editing	3,500	3,000
Grad student tuition remission		1,403
Indirect costs	10,000	21,995
Total	$50,000	$53,361

Live, Interactive Videoconferences

o **Ten, Two-hour Videoconference Series on Algebra for Teachers and Five Two-hour Videoconferences for Foreign Language Teachers**

The following budget is a combination budget for two teacher in-service program series: Ten, two-hour videoconferences on algebra and five, two-hour video-conferences for foreign language teachers. Both were proposed out of the same institution and, hence, they were able to save some money by combining the funding request. A total of 30 hours of programming would be produced under this budget at an average cost of $3,916 per hour.

	Grant	Match
Administrative Personnel		
Project Director (10%)		$ 2,000
Production Personnel		
Producer/Director FTE	32,000	
Camera Operator		11,000
Academic Personnel		
Teacher-Trainer-Algebra ($300 x 10 programs)	3,000	
Teacher-Trainer - F.L. ($500 x 5 programs)	2,500	
Scripts ($300 x 5)	1,500	
Pre-production		
Re-editing Algebra In-Service	17,000	
Open & Close for F.L.		2,850
Production		
Studio & Set-up ($610 x 15 hours)		9,150
Utilities & Maintenance ($150 x 15 hours)	1,500	
Printing of Teacher handouts	5,000	
Supplies		
Video tape and lamps	4,500	
Travel		
Field video/audio	2,500	
Telephone bridge	800	
Mailings	1,500	
Equipment		
1.2 in. VCR Players	3,200	
Field kit (audio/video)		10,000
Indirect costs (10%)	7,500	
Total	$82,500	$35,000

o **Teacher In-Service Workshops in Discipline-Based Art Education**

The following budget is for four modules, each module consisting of three, two hour workshops. So, a total of 12, two-hour videoconferences were proposed under this budget, at an average cost of $5,909 per hour.

	Grant	Match
Personnel		
Project director		$ 7,200
Sr. Producer		1,678
Producer/director	$ 4,932	4,932
Unit director	3,500	2,296
Curriculum design	10,000	10,000
TV teacher	6,000	6,000
Clerical	2,500	2,500
Production		
Off-line editing		640
Studio blocks	6,510	6,510
Post production	2,850	2,850
Portable camera	2,200	2,200
Lighting		468
Audio studio	50	150
Engineering (audio)	1,150	1,165
Scenic design	210	210
Scene construction	300	407
Scenic materials	600	600
Artist	700	735
Dubbing	390	395
Equipment rental	125	125
Honorariums	4,500	4,500
Rights & clearance	5,000	5,000
Operations & supplies		
Postage/duplication	750	750
Telephone (fax)	100	100
Audio tape	25	50
Video tape	600	600
Travel/workshop	5,000	5,000
Education materials	5,000	5,000
5% administration	3,150	3,604
Total	$66,142	$75,665

o **Student Workshops Preparing for the PSAT and SAT Tests**

The following budget is for a series of seven, 50-minute seminars for students preparing to take the PSAT and the SAT exams. Each seminar average $5,685 to produce.

	Grant	Match
Personnel		
Administration		$ 2,055
Curriculum designer	$10,000	
Producer/director	2,055	
Unit director	1,155	
Instructor	3,500	
Clerical	1,300	
Production		
Studio	2,500	1,406
Lighting	112	
Engineering	127	
Scene design/construction	1,312	
Graphics	952	
Rights & clearances	1,000	
Video tape	520	
Operations		
Facilitator training		5,000
Postage & duplication	1,300	500
Telephone		300
Materials & supplies	250	700
Other		500
Travel	1,800	
Equipment		500
TV administration	476	476
Total	$28,359	$11,437

APPENDIX H

AIHEC Colleges Telecommunications Facilities Profile

Overview Chart

Institution	Video Tape Classroom Usage	Satellite Receiver	Video Production Capability	Experienced Video Personnel	Computer Capability	Cable, Fiber or Microwave
Bay Mills Community College	Y	N	c	0	d	
Blackfeet Community College	Y	Y	b	1	e	
Cheyenne River Community College	Y	N	c	0	d	
Crownpoint Institute of Technology	Y	N	c	0	e	
D-Q University	Y	Y	b	0	d	
Dull Knife Memorial College	Y	Y	c	0	d	
Fond Du Lac Community College	Y	N	b	.5	e	Y
Fort Belknap Community College	Y	N	c	0	d	
Fort Berthold Community College	Y	Y	b	0	e	
Fort Peck Community College	Y	Y	b	1	e	f
Haskell Indian Junior College	Y	N	a	2	e	
Institute of American Indian Arts	Y	N	a	3	a	
Lac Courte Oreilles Ojibwa Community College	Y	N	b	1	d	f
Little Big Horn Community College	Y	N	a	2	e	
Little Hoop Community College	Y	N	b	0	d	
Navajo Community College	Y	Y	a	2	d	
Nebraska Indian Community College	Y	N	b	1	e	
Northwest Indian College	Y	Y	a	2	e	
Oglala Lakota College	Y	Y	a	1	e	

Institution	Video Tape Classroom Usage	Satellite Receiver	Video Production Capability	Experienced Video Personnel	Computer Capability	Cable, Fiber or Microwave
Salish Kootenai College	Y	Y	a	2	e	Y
Sinte Gleska University	Y	N	a	2	e	f
Sisseton Wahpeton Community College		Y	b	2	e	
Southwest Indian Polytechnic Institute	Y	Y	a	2	e	
Standing Rock College	Y	Y	c	0	e	f
Stone Child Community College	Y	Y	b	1	d	
Turtle Mountain Community College	Y	N	c	1	e	f
United Tribes Technical College	Y	Y	c	2	e	f

a) good b) modest c) none d) classroom training only e) classroom, Mansfield and other f) future

Y = Yes N = No

The Facilities Profile Overview Chart provides a summary of technical capabilities of the 27 colleges, as pertinent to the project under development. A set of five telecommunications facilities headings are employed in the Overview Chart, as follows:

Video Tape Classroom Usage

This column indicates that all of the colleges are currently using videotape educational resources to supplement their instruction. We do not have information on which subjects are most frequently covered or the number of faculty using the tapes, but nonetheless, this column gives us great assurance that all of the colleges are using TVs and VCRs.

Satellite Receiver

This column simply gives a Y(es) or N(o) as to whether or not a college has a satellite dish on campus. The profiles offer more information about the type of receiver, but it is significant that 14 of the colleges do have satellite equipment and, therefore, have knowledge of satellite technology.

Video Production Capability

This column is a best effort to categorize the level of capability for each of the campuses to create video programming. As of now, it does not reflect the future plans several colleges have indicated, but rather records existing capability. It will be those colleges indicated with an "a" that the Project would look to first as we begin to map out a production plan.

Experienced Video Personnel

This column reflects a best effort to list personnel on each campus that have experience in producing and editing video programs.

Computer Capability

As can be seen, all of the campuses have classroom computer training, and a number (13) have computer capability beyond simply computer labs. The letter "e" indicates that these campuses have local computer networks (LANs), modem hookup with other campuses, Mansfield equipment up and running, and/or other computer capability. The significance here is that it can be stated that all of the campuses are computer literate to some degree, and a number of campuses have a high degree of computer literacy.

Cable, Fiber or Microwave

This column indicates those campuses that currently have or are planning in the future to have microwave, cable or fiber optic links either between campuses of the college or between their campuses and other sites. Once again, it indicates that a number (8) of the colleges are moving quickly into emerging technologies.

APPENDIX I: NATIONAL TECHNOLOGICAL UNIVERSITY (NTU)

NTU is unique among the distance education networks because from the beginning it was set up to become a degree-granting institution. The courses provided by NTU are all produced by leading engineering colleges and universities on a contract basis. Students enroll in NTU's master's degree programs, even though the courses they will take are offered by many different universities, via satellite. NTU could very easily be the best model to use if and when AIHEC pursues the idea of a University of the Air. Meanwhile, AIHEC-member schools may find courses and non-credit programming that could be used in their own on-campus programs of study.

Audience: NTU offers master's level graduate courses in engineering and computer science to students primarily located at their place of work. For the most part, the employer sees NTU as a means of providing a way for their workers to get their master's degrees without having to terminate their employment or take a lot of time away from the workplace. Usually the employer pays the tuition (see below under funding). In addition to credit courses, NTU offers non-credit courses, tutorials, and research videoconferences to individuals at the receive sites who may want a refresher or introduction to new developments in their field.

Productions: For the most part, NTU uses live, interactive, one-way video, two way audio courses and pre-taped telecourses that are simply tapes of a professor teaching in a standard classroom with little or no enhanced production value. The live, interactive, one-way video, two-way audio classes usually involve a professor at one of the leading universities in the country offering the class. If a student is unable to be present for the class on any given day, given the work schedule, the class is taped and viewed later. Computers and fax machines are used to transmit data--tests, homework, tutoring, etc. The pre-taped lecture classes are just that: a collection of pre-taped lectures that constitute a course for which credit is awarded. Students can take the course for credit or audit the course. In addition to its own pre-taped courses, NTU cooperates with the Association for Media-Based Continuing Education for Engineers in offering their pre-taped courses and programs as well. Of all of the distance education networks in existence, NTU has the lowest production value--meaning the video is usually a single professor with very few classroom tools, lecturing. NTU is a great success because this is precisely the level of production needed to accomplish the task of training engineering students. The production value fits the needs of highly motivated engineering graduate students. As the marketplace for graduate engineering training is changing, and the capacity of the satellite increases due to compressed video, NTU is offering many courses that will be of interest to others besides engineers--particularly in the management

field. It is very likely that AIHEC-member colleges will want access to some of NTU's courses and programs in the years ahead.

Programs: NTU offers master's degrees in computer engineering, computer science, electrical engineering, engineering management, manufacturing systems engineering and aerospace engineering. NTU issues a course catalogue each year, similar to the course catalogues issued by all institutions of higher education. In this case, however, the courses are taught by professors located at leading universities across the country. The courses are credited by NTU and the student receives his or her master's degree from NTU. In addition to the fully-credited courses, short courses (almost all of which are pre-taped) are offered as needed. NTU also offers videoconferences (often referred to as research videoconferences) designed for specific audiences interested in specific areas of research. With compressed video, NTU plans to have a kind of jute box choice for students; when they need a course aired, they will "order it" from NTU which, because of the tremendous capacity provided as a result of compressed video, will put it on the schedule.

Organization: NTU is an accredited university which can offer master's level course work and award degrees. There are 25 universities participating in the academic graduate programs offered by NTU. Some institutions participate in all disciplines, while other provide courses only in selected submit matter. Many of these universities produce the majority of the non-credit courses, tutorials, and research videoconferences offered by NTU. NTU cooperates closely with 33 engineering colleges and universities who are members of the Association for Media-Based Continuing Education for Engineering (AMCEE). Prior to NTU, the AMCEE rented or sold videotapes for continuing education of engineering professionals. Now, in addition to tape rental and sales, they offer the programs via the satellite.

Funding: NTU has been the recipient of several PTFP grants since it began in 1983. The first grant in 1983 enabled the network to get started with several uplinks and downlinks at participating universities. Additional grants have expanded the reach of the network. In addition to this capital funding, the participating companies pay tuition for students taking courses. The tuition is about $330 per credit hour, or about $990 per course per student. The producing university gets $240 per credit hour (or about $720 a course per student), and NTU keeps the rest to pay for operations and distribution. Although the tuition is quite high, it still is a good buy for the target audience that they serve. They also collect fees for the non-credit courses, tutorials and research videoconferences.

National Technological University (NTU)
700 Centre Avenue
Fort Collins, CO 80526
(303) 484-0668

APPENDIX I: SATELLITE EDUCATIONAL RESOURCES CONSORTIUM (SERC)

The Satellite Educational Resources Consortium (SERC), unlike the other networks described earlier, serves K-12 schools, not higher education. It is possible, however, that some of the courses and teacher in-service programs may be of interest to AIHEC. Thus, it is included in this review.

SERC consists of a partnership between 23 state departments of education and their respective state education telecommunications agencies.

Audience: Students, faculty, staff and board members of high schools and middle schools.

Productions: All of SERC courses and videoconferences are live and interactive. Students meet their SERC classes much like they meet all of their other classes. The TV teacher has a class roster and calls upon students throughout the class period, or on a rotating basis. Pre-produced segments are sometimes used, including skits for the language classes, but most of the class time is spent with the TV teacher presenting and reviewing information, simulating a traditional classroom.

Programs: SERC offers student courses in math, science and foreign languages. The courses meet the requirement of 180 days of classroom time. In addition to student courses, every day after school (with the exception of Fridays), SERC offers teacher and staff in-service training. These are videoconferences targeting specific teachers or administrators, addressing their specific needs. Once again, all of these are live and interactive.

Organization: SERC is a membership organization. Each state pays from $25,000 to $45,000 to join. SERC is governed by a board of directors composed of the chief state school officer of the member states and the chief executive officer of the state's educational telecommunications network (in some cases called the state public broadcasting network). In addition, the Instructional Advisory Council (composed of a representative from the department of education in each member state) serves as a very active committee which approves courses to be offered, schedules courses, determines start dates, etc. The Technical Advisory Council (composed of the chief engineering from the participating state educational television networks) oversees the technical quality of the network. The responsibility to enroll new schools and new students into SERC courses falls to each state, working with leaders in their education departments and at the state television networks to make the courses as attractive as possible.

Funding:

SERC received a $9.7 million, two-year grant from the U.S. Department of Education's Star Schools program. About two-thirds of the total amount was spent equipping schools with satellite receive capability, purchasing four uplinks, and paying for satellite time ($1 million for the second full year of operations). The rest of the money was used to underwrite the development and production of eight initial courses and manage the system.

In addition to the state membership fees mentioned above, each school pays a per student, per course fee to enroll in a SERC course. The basic fee is $420 per student per course per year; language courses costs $490 per student. Schools are responsible for ordering textbooks themselves, although the SERC course producers provide student workbooks and supplements to the textbook.

About 20% of SERC's operating budget must be raised through grants. SERC was the recipient of a second Star School grant this fall which will help provide matching funds to additional high schools wishing to acquire satellite equipment to join the network.

Satellite Educational Resources Consortium (SERC)
P.O. Box 50,008
Columbia, SC 29250
(803) 252-2782

APPENDIX I: AGRICULTURAL SATELLITE CORPORATION (AG*SAT)

AG*SAT may serve to be the best model for developing an AIHEC telecommunications network. This network began with 27 colleges of agriculture at land grant institutions across the country, and has grown to include 43 institutions. It involves delivering credit courses and many non-credit videoconferences to reach off-campus clientele. Unlike NTU, AG*SAT is not a degree-granting institution; it is more like a broker of courses and programs, facilitating the sharing of resources between and among institutions, and operating the satellite interconnection.

Audience: AG*SAT was established in 1989 to serve several audiences: (1) on-campus students enrolled in affiliated universities' college of agriculture programs; (2) faculty at these universities; (3) staff and participants of Cooperative Extension offices across the country; (4) researchers (on campus and at agriculture-related companies) who need to consult with one another; (5) international agriculture professionals--students and practitioners. The services for the research and international audiences are still in development.

Productions: The credit courses offered via satellite for students primarily on-campus are all live, interactive, one-way video, two-way audio. Like NTU, most of these courses use simple production techniques, although several will have roll-ins to illustrate what they are teaching. The programs for the Cooperative Extension professionals and their clients are almost always videoconferences; occasionally they will offer wrap-arounds to existing or pre-taped programs. The programs for researchers and those in the international field will all be videoconferences, very simply produced, often involving three or less people on camera.

Programs: The credit courses have, thus far, been those courses for which their is clearly a shared need among the participating universities. In many cases, the universities can offer a course more frequently by having their students take the course through AG*SAT rather than teaching it on campus each time. The courses on the satellite are scheduled much like colleges schedule all of their courses, meeting two or three times a week. Some of the courses are offer at both the undergraduate and graduate level simultaneously, with varying course requirements for each type of student. The Cooperative Extension programs are designed for professions and practitioners in the field and could easily be of interest to off-campus groups around AIHEC-member colleges.

Organization: AG*SAT is a non-profit corporation with 40 affiliate universities who elect a Board of Directors. Each affiliate paid $10,000 to establish the network in 1989, and continues to pay a $5,000 annual membership fee. In addition, universities that enroll students in AG*SAT courses

pay a tuition to AG*SAT which is divided with the producing university. So far, there is no charge for the Cooperative Extension programs because the U.S. Department of Agriculture pays directly for Cooperative Extension programs around the country. A producing university pays AG*SAT a modest fee for access to the satellite network, which covers the cost of the satellite delivery.

Funding:

AG*SAT received a $711,000 grant from PTFP in 1990 to help launch the network. This money went toward putting a downlink at each of the participating universities and purchasing four uplinks for universities that made a commitment to be a producer for the network. The following year PTFP awarded AG*SAT a grant of $500,000 for additional downlinks and uplinks. And, this past fall, AG*SAT was awarded another $500,000 for downlinks and uplinks. While this money requires a 50-50 match from the universities, and can only cover equipment expenses, not satellite time nor operational costs, it still has been critical funding to help lay the technical foundation for the network. Additional funding has been received for the production of courses and for operational support from the U.S. Department of Agriculture. The member dues have helped off-set the costs of a single, full-time employee. The network is housed at the Nebraska Education Telecommunications Network in Lincoln, and receives considerable in-kind support from this institution.

AG*SAT
P.O. Box 83111
Lincoln, NE 68501
(402) 472-3611

APPENDIX I

BLACK COLLEGE SATELLITE NETWORK

Created in 1981 to serve historically Black colleges and universities, the Black College Satellite Network (BCSN) is unique in that it provides program services for students, teachers, and administrators from pre-K through university post-graduate levels. Collaborative agreements with corporations and federal agencies have made available technical and non-technical courses, special interest programs and extensive training materials for use on the network.

Audience: At the college level, BCSN provides one-time special video-conferences and workshops to audiences of students, faculty, staff and others in the community. For-credit telecourses produced by Grambling State University are available for educators pursuing Grambling's post-graduate degrees in developmental education. BCSN manages both the Central Educational Telecommunications Network (CETN), which provides satellite programs and services to Title I-eligible, K-12 audiences, and the United States Education Network (USEN), a consortia of four major urban school districts producing interdisciplinary programs for K-6 students.

Production: Almost all programming offered by BSCN is live and interactive, via satellite, using one-way video and two-way audio connections. The telecourses offered by CETN to its K-12 audience are produced by member colleges and universities. For the most part, instructors are college professors, although several courses are taught by professionals from collaborating corporations and public agencies. USEN will produce 16 live, interactive field trips to places of interest located in the four cities making up the consortia.

Programs: The K-12 programs are offered in math, science, foreign languages, culture, and literacy. Pre-service and in-service training is offered through mini-telecourses and one-time workshops to teachers and staff at all educational levels. The programming available to member colleges and universities consists mainly of special one-time videoconferences and workshops. Grambling State University offers six telecourses via satellite for teachers working towards certification or master's and doctoral degrees in developmental education.

Organization: BCSN is a non-profit organization serving over 500 organizations, including nearly 350 colleges and universities. The network was established to enhance, enrich, and expand the quality and availability of curricula, personal and professional development programs for students, faculty, and others at the historically Black colleges and universities. CETN membership is made up of

individual school districts located in 12 states, the District of Columbia, and the U.S. Virgin Islands. USEN membership consists of the New York City, Dallas, Washington D.C., and Philadelphia school districts.

Funding: Initially, BCSN was funded by a combination of sources: contributions, grants, and membership fees. Colleges and universities no longer pay a membership fee, but are billed on pay-per-view basis with costs ranging from $50 to $500 per event. Teachers enrolled in Grambling's post-graduate courses pay tuition directly to Grambling. K-12 programming available through CETN and USEN is funded through a flat membership fee based upon the number of schools in a district, and through grants. CETN was funded by a Start Schools grant of $1.4 million. In 1992, CETN was the recipient of another Star Schools grant of $2.03 million, provided to establish the USEN to deliver interdisciplinary courses to K-6 students.

Black College Satellite Network (BSCN)
2011 Crystal Drive, Suite 1100A
Arlington, VA 22202
(703) 979-6833

APPENDIX I: COMMUNITY COLLEGES SATELLITE NETWORK (CCSN)

The American Association of Community and Junior Colleges (AACJC) has been a trade association for many years. In 1989 it organized the Community College Satellite Network as a service to its members.

Audience: On-campus students and faculty at junior and community colleges. Non-members of CCSN who are interested in a particular program.

Productions: The CCSN provides a range of videoconferences targeting students, staff and faculty on-campus. Increasingly, they are serving continuing education students by offering videoconferences that the colleges purchase and then resell to individuals in the community.

Programs: CCSN issues a program catalogue twice a year which lists the various programs that are available and the costs of each. In addition, separate mailings are made occasionally when a program comes along after the catalogue has gone to press. The receive site for each of the videoconferences receives a camera-ready ten to fifteen page handout that can be duplicated for distribution to the attendees at the sites.

Organization: CCSN is a department within the AACJC and must generate enough money from fees to support a limited staff and satellite distribution costs. Colleges join the CCSN for an annual fee of between $500 and $1500 depending upon college enrollment. As members they receive a discount on the videoconferences offered by the network.

Funding: AACJC received a grant from the Public Telecommunications Facilities Program (PTFP), U.S. Department of Commerce, to install six uplinks at six institutions across the country and downlinks at a significant number of institutions that did not have satellite receive equipment. In this way, the videoconferences can originate at various locations around the country, depending upon where the expertise is. A fee of about $200 per videoconference (per event) is charged to the members; non-members usually pay around $300. This is considered a site fee. The site is then usually free to charge participants at their site for attending the videoconference. Usually these videoconferences are not part of an academic course, although sometimes the videoconference is very appropriate for a particular course. Increasingly, community colleges are serving their local businesses and professionals by hosting the videoconference and charging a minimum amount to pay for the costs of the event. The producers and CCSN share in the revenue generated by a videoconference. CCSN does not have to generate a lot of revenue, but does try to break even on the staffing and marketing costs.

Community College Satellite Network (CCSN)
One Dupont Circle, NW, Suite 410
Washington, DC 20036
(202) 728-0200

APPENDIX I: PBS ADULT LEARNING SERVICE (ALS) AND PBS ADULT LEARNING SATELLITE SERVICE (ALSS)

The PBS Adult Learning Service is 11 years old this year, and has enrolled slightly over two million students in telecourses, involving almost 1,900 colleges and universities across the country.

Audience: The target audience for telecourses is adult learners, primarily viewing at home, enrolled in their local college or university. The target audience for videoconferences is professionals needing in-service training, who participate either at their place of work, a nearby campus, or at a local public television station. ALSS videoconferences reach students, faculty, staff, community leaders, and other professionals.

Productions: The adult learners reached at home are viewing telecourse broadcasts, distributed via their local public television station, via the local cable system, or directly off of satellite. In some cases the local college will tape the telecourse off-air and let the students borrow the tapes or come on to campus to view them. The Adult Learning Satellite Service (ALSS) is the distributor of a range of videoconferences, covering a range of topics, each one usually targeting a specific audience.

Programs: ALS has as many as 60 telecourses that may be of interest to AIHEC. A number of these have been funded through the Annenberg/CPB Project and could possibly be offered for significantly reduced fee. It is possible that a reduction in fees could be secured during a pilot phase, as a result of the AIHEC network contracting for courses, rather than individual colleges. In addition, ALSS offers 20-30 videoconferences each year.

Organization: ALS is a department within PBS, a non-profit membership organization of 346 public television stations around the country. ALSS is a unit within the ALS department. The PBS Board of Directors consists of public television station managers and lay people who serve on their local public television stations' boards. The ALS department is self-supporting from the fees charged for its programming services.

Funding: ALS has been self-supporting for nine years. Colleges are charged a licensing fee for use of each telecourse (usually between $300 and $500 per semester, per college, plus a per student enrolled fee of $15). This fee is set by contract between ALS and the telecourse producer. The producer is then paid a royalty out of the money collected. ALS uses the remaining money to pay satellite distribution, marketing and staff costs. ALSS videoconferences are usually offered for a site fee of between $250 and $500. Substantial discounts and free videoconferences are available to ALSS Associates.

PBS Adult Learning Service
1320 Braddock Place
Alexandria, VA 22314
(703) 739-5000

APPENDIX J

The levels of video production capability described as follows offer AIHEC colleges the opportunity to select the one most suitable in terms of physical and personnel requirements.

- **Basic TV Originating Classroom**

  This option upgrades the Basic TV Reception-only Classroom to enable video origination. Turnkey installation costs will be $30,000 to $35,000, in addition to the $15,000 already spent for the Basic TV Reception Classroom package. (An additional estimated $30,000 will be needed to have the signal digitally compressed to send via T-1 or T-3 telephone lines to the nearest satellite uplink.) The equipment for this option includes:

  A. Cameras

  2 Single-chip, 1/2" CCED, color, S/N 46dB, 330K picture elements, genlockable, 460 lines horizontal resolution, minimum illumination 5 lux, 24vAC, 60Hz
  1 Video overhead graphics presentation unit, including zoom lens and supplementary lights
  Specifications same as above

  B. Lens, Zoom, to fit 2 basic cameras selected

  2 6X (probably 8.5 to 51 mm), serve control, auto iris (8X, 7 to 56 mm better but probably not worth the extra cost).

  C. Camera Accessories

  2 Camera power transformers, 110-24vAC
  2 Wall mounts, 18" wall clearance, 35 lb., capacity, 20 sq. in. wall plate area

  D. Remote Pan/Tilt, Zoom/Focus System

  2 Camera/lens systems
  180 degrees pan, $\pm$ 20 degrees tilt, 15 lb. capacity, technician or instructor control

  E. Video Switching/Routing/Processing

  2 Program/routing switchers
  Six program inputs, vertical interval switching
  4 Video distribution amplifiers

  F. Video Monitoring

  1 Monitor, program

13", color, 2 input, speakers, 450 lines horizontal resolution

2 Monitors, video sources
Triples, 35X 5", B/W, 600 lines horizontal resolution

1 Monitor, instructor, 13" B/W

G. Microphones

10 Press-to-talk paging
Omnidirectional, dynamic, one for each 3 students/viewers

1 Lavalier
Omnidirectional, dynamic

H. Microphone Mixing/Audio Processing

2 Microphone mixers
Four inputs, VU meter, tone oscillator

2 Audio distribution amplifiers

1 Compressor/limiter/expander/gate
Dual channel

I. Audio Monitoring

2 Classroom speakers with mounting brackets
75 watts, 6.5" LF, 1" HF

1 Speaker, amplifier
2 channel, 20 watts/channel @ 8 ohms

J. Miscellaneous Equipment

2 Equipment Frames

2 Power strips, 6 outlets, switchable

K. Telephones

1 Telephone, touch tone

1 Telephone, line installation

1 Audio/telephone coupler

L. Installation (All highly variable estimates depending upon room selected and other local conditions.)

Teaching station
Cable, connectors, adapters, miscellaneous

*Microphones specified in the basic reception package are designed for use only with the telephone conferencing unit.

- **Advanced TV Originating Classroom**

This option upgrades the Basic TV Originating Classroom outlined above, providing more advanced equipment and capability. The costs for this option include $15,000 for the Basic TV Reception Classroom, $30,000 to $35,000 for the Basic TV Originating Classroom, plus an additional $55,000 to $65,000 for the equipment necessary for the Advanced TV Originating Classroom. These costs include turnkey installation of the equipment; they do not include an estimated $30,000 to digitally compress the signal in order to be able to send via T-1 or %-3 telephone lines to the nearest uplink.)

A. Videocassette Recorder/Player

1 Recorder/player, VHS, multi-speed cable ready, real-time read out, 250 lines horizontal resolution, S/N 45dB

B. Video Switching/Routing/Processing

1 Program switcher, special effects generator
Six program inputs, vertical interval switching, dissolves, wipes, genlock, sync generator
1 Waveform monitor and vectorscope with rack mount kit
1 Time base corrector and frame synchronizer
1 Demodulator (if incoming RF single) dual input, cable ready

C. Video Monitoring

1 Monitor/receiver, classroom
26", color, cable ready, 450 lines horizontal resolution
1 Wall mount for monitor/receiver for monitors
1 Monitor, character generator
13" color, 450 lines horizontal resolution
1 Monitor, Triple, 3X 5", B/W, 600 lines horizontal resolution

D. Character Generator

Variable character sizes, fonts, proportional spacing, roll, crawl, manual and automatic sequencing, disk drive, 400 page memory

E. Microphone Mixing/Audio Processing

1 Automatic microphone mixing system
1 Audio distribution amplifiers
1 Graphic equalizer
10 equalizers on 1 octave centers
2 Audio interfaces

F. Audio Monitoring

2 Control room speakers, 4"
1 Headset, dual muff

G. Miscellaneous Equipment

2 Equipment racks
2 Power strips, 6 outlets, switchable

H. Telephone, touch tone, for second line

I. Installation (All highly variable estimates depending upon room selected and other local conditions.)

Room modification; control room, lighting, power, cable routing, etc.
Tables, viewer seating
Cable, connectors, adapters, miscellaneous, labor

- **Video Teleconferencing System**

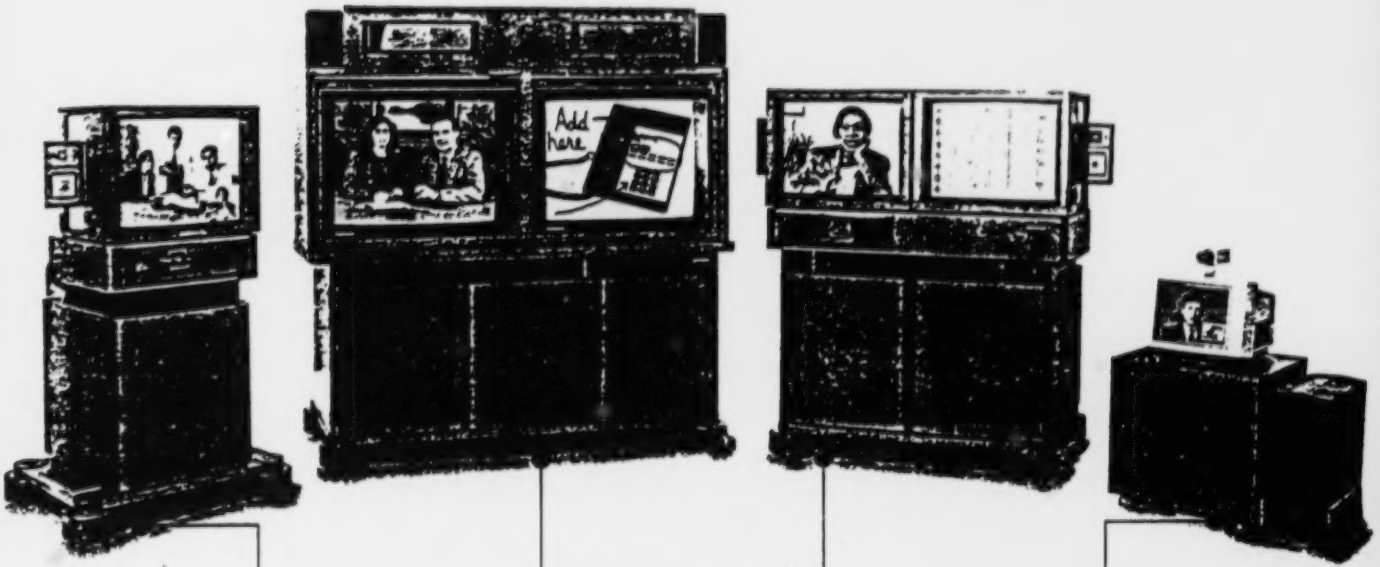
This option provides a ready-to-use, compact teleconferencing unit that is easy to install and operate, requiring no operating personnel. The unit includes compressed video equipment, a built-in camera and microphone focused on subjects in front of the device. The video/audio signal is compressed and sent by telephone to the nearest uplink for delivery via the AIHEC Network. The equipment fits neatly into a single storage unit that can be rolled into the classroom. The equipment can be plugged in and hooked up to the telephone outlet, ready to use in less than 30 minutes. The operator of the system can easily be the teacher or a teaching assistant. No prior technical experience is required to operate the equipment.

This option has the advantage of being able to provide two-way video between two campuses that are linked via fiber optics or high quality telephone lines. This equipment might be especially attractive to those AIHEC campuses linking with statewide fiber optic networks.

There are currently six market leaders manufacturing these teleconferencing units:

British Telecom (BT);
Compression Labs, Inc. (CLI);
GPT Video Systems (GPT);
NEC American (NEC);
Picture Tel Corporation (FTC); and
Video Telecom Corporation (VTC).

The cost for this equipment varies somewhat, but currently runs about $70,000 per unit, including the compression equipment. See following page for a picture of the unit.



VP125

Designed for general conference room use, it's ideal for meetings of five people or less. A great way to add videoconferencing to your existing conference room.

BK235

This system is designed for use in large conference rooms and classrooms where large groups of people work together. The thirty-five inch monitors give participants at the remote site a real presence in the room.

Right monitor depicts Pan Pal Graphics®

BK225

While the BK225 is ideally suited for mid-sized conferences of fifteen or twenty people, its size makes it versatile enough for a wide range of uses.

Right monitor depicts ComputerConferencing

VP113

The ideal personal videoconferencing system; designed to fit on your desktop.

APPENDIX K

CAMPUS AIHEC NETWORK COORDINATOR

Sample Position Description

GENERAL DESCRIPTION:

Provide overall coordination between faculty, staff and students of the college with the AIHEC Telecommunications Network to insure the most effective and efficient use of programming delivered via the network.

SPECIFIC DUTIES:

1. Serve as the communications link between the campus and the AIHEC Telecommunications Network

- o Read and stay informed about all Network policies and procedures.
- o Read all correspondence from the Network and forward to academic deans, classroom instructors as others as appropriate.
- o Distribute information about programs and courses to appropriate staff, faculty and students.
- o Distribute textbooks, course materials and other information to classroom instructors and other personnel as appropriate.
- o Prepare and distribute regular campus satellite schedule, and ensure that the distance education classroom is reserved, as appropriate.

2. Provide general oversight for the technical operations on campus associated with the Telecommunications Network

- o Establish and maintain liaison with technical and computer staff on campus.
- o Oversee the turnkey installation of satellite and distance learning classroom equipment in accordance with instructions provided by Network staff.
- o Make sure classroom equipment is in place and functioning prior to beginning of each term.
- o Monitor the equipment on a regular basis.
- o Establish troubleshooting procedures in the event of equipment failure.

o Arrange for the taping of satellite programming as requested by respective faculty for use to supplement campus classes or for subsequent use as an individual study class or for group instruction.

3. Participate in and provide training opportunities

o Participate in various training opportunities provided by the equipment vendors and the Network staff in order to learn how best to use the equipment.

o Provide in-serve training to faculty and staff in the use of the classroom equipment.

4. Recruit students, faculty and staff

o Work closely with academic dean and department heads to recruit students for telecourses.

o Work with staff and others to recruit participants for teleconferences, as appropriate.

o Work with tribal leadership and other contacts to provide telecommunication services to non-student populations on the reservation.

5. Oversee registration and enrollment procedures and policies

o Ensure that registration materials are completed and submitted in a timely manner.

o Perform record keeping tasks associated with student registration and registration of participants for teleconferences.

o Ensure that invoices from the Network are paid in a timely manner.

6. Assist Classroom Instructors

o Ensure timely selection of classroom instructors for each course.

o Train classroom instructors on the use of the equipment.

o Monitor the equipment to ensure that is functioning appropriately.
o Support activities of classroom instructors; assist when necessary.

7. Serve as Network spokesperson on campus and in the community

o Provide information about the Network to college personnel, administrators, parents, press and other interested groups.

o Provide opportunities for a wide variety of individuals on and off-campus to experience the benefits of telecommunications.

8. Participate in Evaluation

- o Complete and return questionnaires addressed to the Campus Coordinator.
- o Distribute and collect other evaluation forms, as requested.

9. Other duties as assigned

MINIMUM QUALIFICATIONS:

A bachelors degree with at least three years teaching experience. Experience and knowledge of computer technology. Experience working with faculty as a resource person, trainer, or librarian. Demonstrated ability to work with community groups and non-student populations. Experience in marketing and promotion. Knowledge of the cultural heritage of Native Americans. Excellent communication skills.

DESIRABLE QUALIFICATIONS:

Course work in communications, computers and education. Teaching experience at the college level. An understanding of and sensitivity to the special educational needs of Native Americans. Experience with distance education, as a user or producer of programming. Experience using telecourses via satellite.